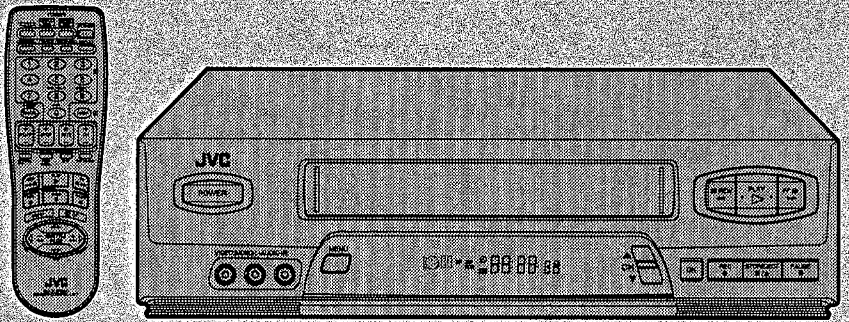
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-VP652U/VP653U



VHS
Hi-Fi
SQPB
VCR plus+™
Easy Taping.
MOVIE▸▸ADVANCE™

Regarding service information other than these sections, refer to the HR-VP654U service manual (No. 82641). Also, be sure to note important safety precautions provided in the service manual. V20730

SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-VP652U)*

GENERAL

Power requirement : AC 120 V∿ , 60 Hz
Power consumption
  Power on : 22 W
  Power off : 3 W
Temperature
  Operating : 5°C to 40°C (41°F to 104°F)
  Storage : –20°C to 60°C (–4°F to140°F)
Operating position : Horizontal only
Dimensions (W x H x D) : 360 x 94 x 273 mm (14-3/16" x 3-3/4" x 10-3/4")
Weight : 3.0 kg (6.6 lbs)
Format : VHS NTSC standard
Maximum recording time
  SP : 210 min. with ST-210 video cassette
  EP : 630 min. with ST-210 video cassette

VIDEO/AUDIO

Signal system : NTSC-type color signal and EIA monochrome signal, 525 lines/60 fields
Recording/Playback system : DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio : 45 dB
Horizontal resolution : 240 lines
Frequency range
  Normal audio : 70 Hz to 10,000 Hz
  Hi-Fi audio : 20 Hz to 20,000 Hz
Input/Output : RCA connectors (IN x 1, OUT x 1)

TUNER

Tuning system : Frequency-synthesized tuner
Channel coverage
  VHF : Channels 2–13
  UHF : Channels 14–69
  CATV : 113 Channels
RF output : Channel 3 or 4 (switchable; preset to Channel 3 when shipped) 75 ohms, unbalanced

TIMER

Clock reference : Quartz
Program capacity : 1-year programmable timer/ 8 programs
Memory backup time : Approx. 10 min.

ACCESSORIES

Provided accessories : RF cable (F-type), Infrared remote control unit, "AA" battery x 2

Specifications shown are for SP mode unless otherwise specified. E. & O.E. Design and specifications subject to change without notice.

COPYRIGHT © 1998 VICTOR COMPANY OF JAPAN, LTD.

**No. 82644
March 1998**

TABLE OF CONTENTS

5. PARTS LIST

5.2 CABINET AND CHASSIS ASSEMBLY <M2> 5-2

The following table indicate different points between models HR-VP654U/U(C), HR-VP652U and HR-VP653U/U(C).

MODEL ITEM	HR-VP654U/U(C)	HR-VP652U	HR-VP653U/U(C)
BEST SYSTEM	AUTO PICTURE	ACTIVE VIDEO CALIBRATION	←
CHILD LOCK	—	○	○
CABLE BOX & DBS RECEIVER CONTROL	○	—	—
AUDIO/VIDEO IN for REAR	○	—	—
AV COMPU-LINK	○	—	—

Notes : • Mark ○ is used. • Mark — is not used. • Mark ←— is not used.

The following table indicate different parts number between models HR-VP654U/U(C), HR-VP652U and HR-VP653U/U(C).

PACKING AND ACCESSORY ASSEMBLY <M1>

⚠ REF. No.	MODELS ITEM	HR-VP654U	HR-VP654U(C)	HR-VP652U	HR-VP653U	HR-VP653U(C)
301	PACKING CASE	LP30164-055B	LP30164-057B	LP30154-029B	LP30154-031B	LP30154-033B
302	CUSHION ASSY	LP30115-001B	←	PQ35464A-5	←	←
303	POLY BAG	PQM30021-93	←	PQM30021-92	←	←
306	REMOTE CONTROLLER	LP20337-003A	←	LP20337-002A	←	←
⚠ 310	INST BOOK(EN)	LPT0019-001A	←	LPT0018-001A	LPT0020-001A	←
⚠ 310	INST BOOK(FR)	—	LPT0019-003A	—	—	LPT0020-003A
312	Q.S. SHEET	LPT0019-002A	—	LPT0018-002A	LPT0020-002A	—
313	CONECTION SHEET	—	PU36560	—	—	PU36560
314	SER. NET CARD	—	BT-20071B	—	—	BT-20071B
315	LED CABLE ASSY	PEAC0370	←	—	—	—
316	WARRANTY CARD	—	BT-52002-1	—	—	BT-52002-1
317	REGIST. CARD	BT-51006-1	—	BT-51006-1	←	—

CABINET AND CHASSIS ASSEMBLY <M2>

⚠ REF. No.	MODELS ITEM	HR-VP654U	HR-VP654U(C)	HR-VP652U	HR-VP653U	HR-VP653U(C)
550	FRONT PANEL ASSY	LP10017-019B	←	LP10123-002B	LP10123-003B	←
550A	CASSETTE DOOR	PQ21884-91	←	PQ21884-21	←	←
550C	DISPLAY WINDOW	LP20019-010A	←	PQ21905-16-7	←	←
551	TOP COVER ASSY	LP30457-002B	←	PQ11898-13-13	←	←
⚠ 560	BOTTOM CHASSIS	LP10093-002B	←	LP20262-001B	←	←
562	DRUM SHIELD	LP20283-001A	←	—	—	—
563	SCREW, X2 DRUM SHIELD	QYTDST2606Z	←	—	—	—
565A	PAD	LP30019-008A	←	—	—	—
569	STAY	LP30386-001A	←	—	—	—
569A	PAD	LP30019-007A	←	—	—	—

Notes : Mark — is not used.
Mark ←— is same as left.

MAIN BOARD ASSEMBLY <03>

⚠ REF. No.	MODELS ITEM	HR-VP654U	HR-VP654U(C)	HR-VP652U	HR-VP653U	HR-VP653U(C)
PW1	MAIN BOARD ASSY	LPA10001-03C1	←	LPA10001-05B1	←	←
Q3005	TRANSISTOR	UN5211	←	—	—	—
Q7201	TRANSISTOR	2SB1256	←	—	—	—
D3007	DIODE	1N4148M	←	—	—	—
R32	MG RESISTOR	NRSA02J-750X	←	—	—	—
R2205	MG RESISTOR	NRSA02J-473X	←	—	—	—
R2209	MG RESISTOR	NRSA02J-682X	←	—	—	—
R2215	MG RESISTOR	NRSA02J-682X	←	—	—	—
R2219	MG RESISTOR	NRSA02J-473X	←	—	—	—
R2607	RESISTOR	QRE141J-101Y	←	—	—	—
R2608	RESISTOR	QER141J-101Y	←	—	—	—
R3050	MG RESISTOR	NRSA02J-102X	←	—	—	—
R3081	MG RESISTOR	NRSA02J-102X	←	—	—	—
R3101	MG RESISTOR	NRSA02J-102X	←	—	—	—
R3236	MG RESISTOR	NRSA02J-103X	←	—	—	—
R7051	MG RESISTOR	NRSA02J-393X	←	—	—	—
R7202	MG RESISTOR	NRSA02J-471X	←	—	—	—
R7203	MG RESISTOR	NRSA02J-222X	←	—	—	—
R7204	OMF RESISTOR	QRL01DJ-100X	←	—	—	—
C53	E CAPACITOR	QEKJ1HM-105	←	—	—	—
C7207	E CAPACITOR	QETC0JM-477	←	—	—	—
L7201	COIL	QQL242J-101Z	←	—	—	—
L7202	COIL	QQL242J-101Z	←	—	—	—
S7016	TACT SWITCH,REVIEW	QSW0619-002Z	←	—	—	—
J1	PIN JACK,A/V IN	QNN0009-001	←	—	—	—
TB1	TERMINAL BOARD	LP20316-001A	←	PQ21910-3	←	←
FW3001	WIRE,(1-2) R.PAUSE	QUM032-13A4A4	←	—	—	—
FW3002	WIRE,(1-2) C.BOX CTL	QUM032-28A4A4	←	—	—	—
ET1	EARTH PLATE(RF)	—	—	PQ21623-2	←	←

R. PAUSE BOARD ASSEMBLY <06>

⚠ REF. No.	MODELS ITEM	HR-VP654U	HR-VP654U(C)	HR-VP652U	HR-VP653U	HR-VP653U(C)
PW2	R.PAUSE BOARD ASSY	LPA10001-01B2	←	—	—	—
J7104	MINI JACK	PU60612	←	—	—	—

C.BOX CTL BOARD ASSEMBLY <92>

⚠ REF. No.	MODELS ITEM	HR-VP654U	HR-VP654U(C)	HR-VP652U	HR-VP653U	HR-VP653U(C)
PW3	C.BOX CTL BOARD ASSY	LPA10001-01B3	←	—	—	—
R7155	MG RESISTOR	NRSA02J-101X	←	—	—	—
J7105	MINI KACK	PU60612	←	—	—	—

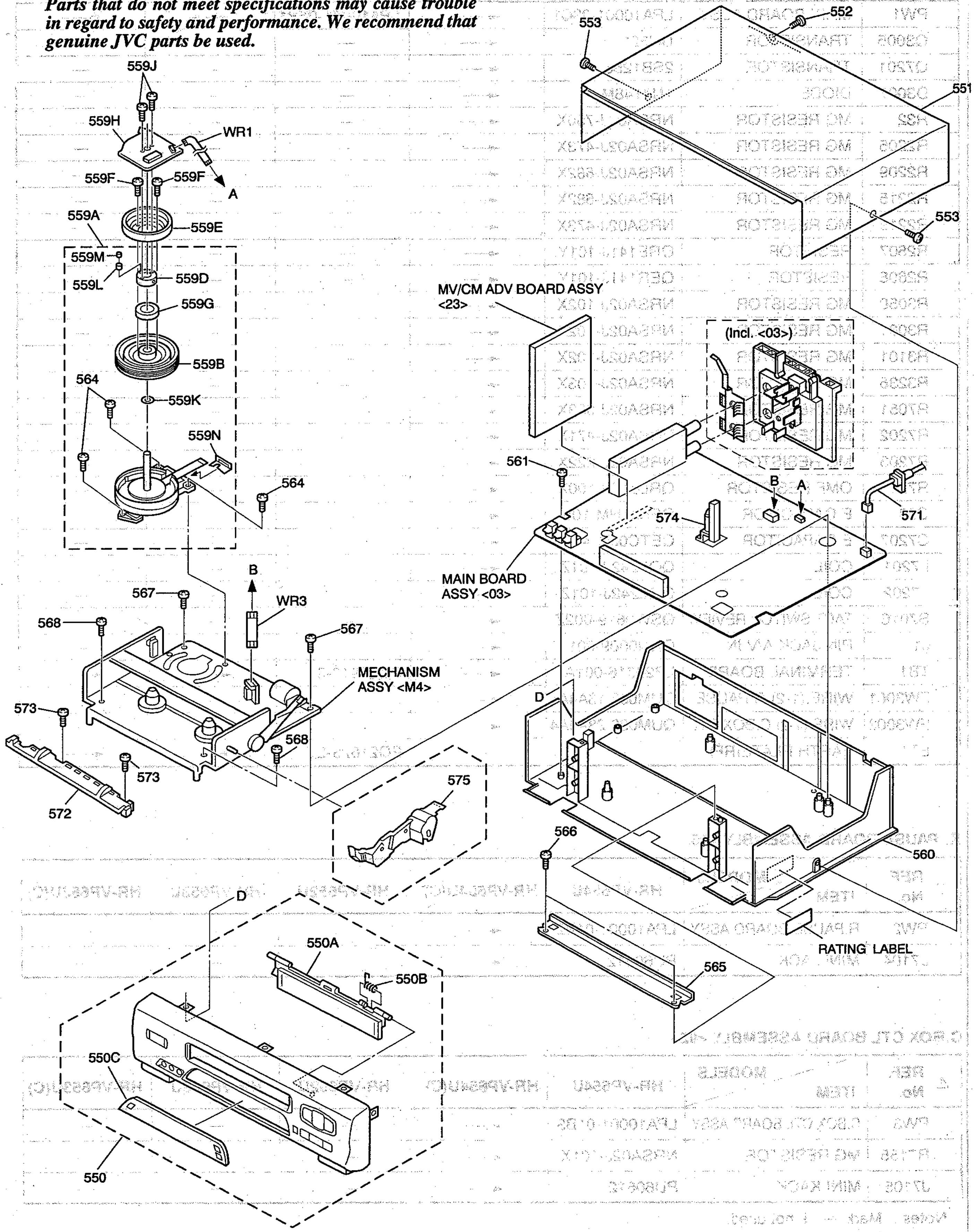
Notes : Mark — is not used.
Mark ←— is same as left.

SECTION 5
PARTS LIST

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.


552
553
551
559J
559H
WR1
559F
559F
A
559A
559E
559M
559D
559L
559G
559B
564
559K
559N
564
MV/CM ADV BOARD ASSY
<23>
(Incl. <03>)
561
B
A
574
571
MAIN BOARD
ASSY <03>
B
WR3
567
568
567
MECHANISM
ASSY <M4>
573
568
573
572
575
D
566
560
RATING LABEL
565
D
550A
550B
550C
550

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

CABINET AND CHASSIS ASSEMBLY <M2>

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	550	LP10123-002B	FRONT PANEL ASSY,VP652U
		LP10123-003B	FRONT PANEL ASSY,VP653U/U(C)
	550A	PQ21884-21	CASSETTE DOOR
	550B	PQ46448	TORSION SPRING
	550C	PQ21905-16-7	DISPLAY WINDOW
	551	PQ11898-13-13	TOP COVER ASSY
	552	QYTDSF3010M	SCREW,TOP COVER(REAR)
	553	QYTDSF3010M	SCREW,X2 TOP COVER(SIDE)
	559A	LP20289-001A	DRUM SUB ASSY
	559B	LP20030-001A	UPPER DRUM ASSY
	559D	LP40028-001A	COLLAR ASSY
	559E	QAR0020-001	ROTOR ASSY
	559F	QYSPSP3006Z	SCREW,X2
	559G	PDM4439	CAP
	559H	QAR0021-001	STATOR ASSY
	559J	QYSPSP2606Z	SCREW,X2
	559K	PDM4444-19-2	WASHER
	559L	LP40323-001A	CONTACT
	559M	LP30004-005A	COMPRES.SPRING
	559N	LP40174-001A	FPC PLATE
⚠	560	LP20262-001B	BOTTOM CHASSIS
	561	QYTDSF3010Z	SCREW,MAIN
	564	QYTPST2608Z	SCREW,X3 DRUM
	565	LP30312-001A	BRACKET(CHASSIS)
	566	QYTDSF3010Z	SCREW,X2 BRACKET(CHASSIS)
	567	QYTDSF4012Z	SCREW,X2 MECHA
	568	QYTDSF3010Z	SCREW,X2 MECHA
⚠	571	QMP14K0-170	POWER CORD
	572	LP30247-001A	FRONT BRACKET
	573	QYTDST2606Z	SCREW,X2 FRONT BRACKET
	574	LP40253-001B	STOPPER
	575	LP20324-002B	DOOR OPENER
	WR1	QUQ212-0520CG	FFC WIRE,DRUM CN3002
	WR3	WJT0005-001A	E-CARD WIRE,A/C HEAD CN2001

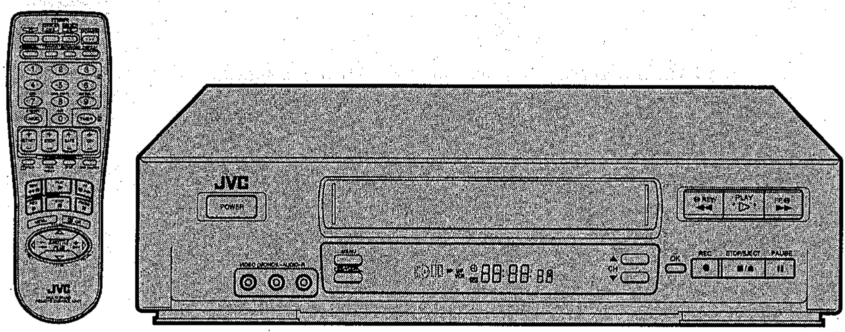
V20730

JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-VP654U/VP655U/VP656U



Hi-Fi VHS

SQPB

VCR Plus+ Cable Box Control
Easy Taping.

MOVIE▸▸ADVANCE™

SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-VP654U)*

GENERAL

Power requirement	: AC 120 V∿ , 60 Hz
Power consumption	
Power on	: 22 W
Power off	: 3 W
Temperature	
Operating	: 5°C to 40°C (41°F to 104°F)
Storage	: –20°C to 60°C (–4°F to140°F)
Operating position	: Horizontal only
Dimensions (W x H x D)	: 400 x 94 x 273 mm (15-3/4" x 3-3/4" x 10-3/4")
Weight	: 3.1 kg (6.9 lbs)
Format	: VHS NTSC standard
Maximum recording time	
SP	: 210 min. with ST-210 video cassette
EP	: 630 min. with ST-210 video cassette

VIDEO/AUDIO

Signal system	: NTSC-type color signal and EIA monochrome signal, 525 lines/60 fields
Recording/ Playback system	: DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 240 lines
Frequency range	
Normal audio	: 70 Hz to 10,000 Hz
Hi-Fi audio	: 20 Hz to 20,000 Hz
Input/Output	: RCA connectors (IN x 2, OUT x 1)

TUNER

Tuning system	: Frequency-synthesized tuner
Channel coverage	
VHF	: Channels 2–13
UHF	: Channels 14–69
CATV	: 113 Channels
RF output	: Channel 3 or 4 (switchable; preset to Channel 3 when shipped) 75 ohms, unbalanced

TIMER

Clock reference	: Quartz
Program capacity	: 1-year programmable timer/ 8 programs
Memory backup time	: Approx. 10 min.

ACCESSORIES

Provided accessories	: RF cable (F-type), Infrared remote control unit, "AA" battery x 2, Controller

Specifications shown are for SP mode unless otherwise specified.
E. & O.E. Design and specifications subject to change without notice.

COPYRIGHT © 1998 VICTOR COMPANY OF JAPAN, LTD.

No.82641
February 1998

TABLE OF CONTENTS

Section Title Page

Important Safety Precautions

INSTRUCTIONS (HR-VP654U)

1. DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART 1-1
1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY 1-1
1.3 DISASSEMBLY/ASSEMBLY METHOD 1-1
1.4 SERVICE POSITION 1-4
1.4.1 How to take out the Mechanism and Main board assemblies 1-4
1.5 MECHANISM SERVICE MODE 1-5
1.5.1 How to set the "MECHANISM SERVICE MODE" 1-5
1.6 EMERGENCY DISPLAY FUNCTION 1-6
1.6.1 How to display record of an emergency faults 1-6
1.6.2 Detail of emergency faults 1-6
1.6.3 How to clear emergency record 1-6
1.7 SYSCON CIRCUIT 1-7
1.7.1 Syscon CPU pin function (IC3001) 1/2 1-7
1.7.2 Syscon CPU pin function (IC3001) 2/2 1-8

2. MECHANISM ADJUSTMENT

2.1 BEFORE STARTING REPAIR AND ADJUSTMENT 2-1
2.1.1 Precautions 2-1
2.1.2 Checking for Proper Mechanical Operations 2-1
2.1.3 Manually Removing the Cassette Tape 2-1
2.1.4 Jigs and Tools Required for Adjustment 2-3
2.1.5 Maintenance and Inspection 2-3
2.2 REPLACEMENT OF MAJOR PARTS 2-7
2.2.1 Before Starting Disassembling 2-7
2.2.2 How to Set the Mechanism Assembling Mode 2-7
2.2.3 Cassette Holder Assembly 2-7
2.2.4 Pinch Roller Arm Assembly 2-10
2.2.5 Guide Arm and Press Lever 2-10
2.2.6 Audio Control Head 2-10
2.2.7 Loading Motor 2-11
2.2.8 Capstan Motor 2-11
2.2.9 Pole Base (on the supply or take-up side) 2-11
2.2.10 Rotary Encoder 2-12
2.2.11 Clutch Unit 2-12
2.2.12 Change Lever and Direct Gear 2-12
2.2.13 Link Lever 2-12
2.2.14 Cassette Gear, Control Cam and Worm Gear 2-13
2.2.15 Control Plate 2-13
2.2.16 Loading Arm (on the supply or take-up side) and Loading Arm Gear Shaft 2-14
2.2.17 Take-up Lever, Take-up Head and Control Plate Guide 2-15
2.2.18 Capstan Brake 2-15
2.2.19 Drive Gear and Drive Arm 2-15
2.2.20 Sub Brake (on the take-up side) 2-16
2.2.21 Main Brake (on the take-up side), Reel Disk (on the take-up side) and Main Brake (on the supply side) 2-16
2.2.22 Tension Brake, Reel Disk (on the supply side) and Tension Arm 2-16
2.2.23 Idler Lever, Idler Arm and Reel Shaft 2-17
2.2.24 Stator Assembly 2-17
2.2.25 Rotor Assembly 2-17
2.2.26 Upper Drum Assembly 2-18
2.3 MAJOR PARTS INSTALLATION (PHASE MATCHING BETWEEN MECHANICAL PARTS) 2-19
2.3.1 Before Assembly of the Parts 2-19
2.3.2 Loading Arm Assembly (on the Supply or Take-up Side) 2-19
2.3.3 Control Plate 2-19
2.3.4 Rotary Encoder 2-19
2.3.5 Control Cam, Cassette Gear and Link Lever 2-20
2.3.6 Relay Gear, Limit Gear and Drive Gear 2-21
2.4 COMPATIBILITY ADJUSTMENT 2-21
2.4.1 Checking/Adjustment of FM Waveform Linearity 2-21
2.4.2 Checking/Adjustment of the Height and Tilt of the Audio Control Head 2-23
2.4.3 Checking/Adjustment of the Audio Control Head Phase (X-Value) 2-23
2.4.4 Checking the Triple-width Auto Tracking 2-24
2.4.5 Checking/Adjustment of the Tension Pole 2-24
2.4.6 Adjustment of the Tension Stud 2-24
2.4.7 Main Brake Torque Adjustment 2-24

3. ELECTRICAL ADJUSTMENT

3.1 PRECAUTION 3-1
3.1.1 Required test equipment 3-1
3.1.2 Required adjustment tools 3-1
3.1.3 Color bar signal,color bar pattern 3-1
3.2 SERVO CIRCUIT 3-2
3.2.1 PB switching point 3-2
3.2.2 Slow tracking preset 3-2
3.3 DEMODULATOR CIRCUIT 3-3
3.3.1 Input level 3-3
3.3.2 Stereo VCO 3-3
3.3.3 Stereo filter 3-3
3.3.4 Separation - 1 3-3
3.3.5 Separation - 2 3-4
3.3.6 SAP VCO 3-4
3.4 VIDEO CIRCUIT 3-4
3.4.1 Auto picture 3-4
3.5 ON SCREEN CIRCUIT 3-5
3.5.1 Character position 3-5

4. CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM 4-1
CIRCUIT BOARD NOTE 4-2
4.1 BOARD INTERCONNECTIONS 4-3
4.2 VIDEO/N.AUDIO SCHEMATIC DIAGRAM 4-5
4.3 ON SCREEN SCHEMATIC DIAGRAM 4-7
4.4 FMA SCHEMATIC DIAGRAM 4-9
4.5 SYSCON SCHEMATIC DIAGRAM 4-11
4.6 SWITCHING REGULATOR SCHEMATIC DIAGRAM 4-13
4.7 TUNER SCHEMATIC DIAGRAM 4-15
4.8 SW/DISPLAY SCHEMATIC DIAGRAM 4-17
4.9 CONNECTION SCHEMATIC DIAGRAM 4-19
4.10 MAIN AND A/C HEAD CIRCUIT BOARDS 4-21
4.11 MOVIE/COMMERCIAL ADVANCE SCHEMATIC DIAGRAM 4-25
4.12 MOVIE/COMMERCIAL ADVANCE CIRCUIT BOARD 4-27
4.13 CABLE. BOX SCHEMATIC DIAGRAM 4-28
4.14 FDP GRID ASSIGNMENT AND ANODE CONNECTION 4-29
4.15 REMOTE CONTROL SCHEMATIC DIAGRAM 4-30
4.16 VOLTAGE CHARTS 4-31
4.17 SYSTEM CONTROL BLOCK DIAGRAM 4-33
4.18 VIDEO BLOCK DIAGRAM 4-35
4.19 AUDIO BLOCK DIAGRAM 4-37

5. PARTS LIST

5.1 PACKING AND ACCESSORY ASSEMBLY <M1> 5-1
5.2 CABINET AND CHASSIS ASSEMBLY <M2> 5-2
5.3 MECHANISM ASSEMBLY <M4> 5-4
5.4 ELECTRICAL PARTS LIST 5-6
MAIN BOARD ASSEMBLY <03> 5-6
R.PAUSE BOARD ASSEMBLY <06> 5-12
AUDIO/CONTROL HEAD BOARD ASSEMBLY <12> 5-12
MV/CM ADV BOARD ASSEMBLY <23> 5-12
LOADING MOTOR BOARD <55> 5-12
C.BOX CTL BOARD ASSEMBLY <92> 5-12

The following table lists the differing points between Models (HR-VP654U/U(C), HR-VP655U and HR-VP656U/U(C) in this series.

	HR-VP654U/U(C)	HR-VP655U	HR-VP656U/U(C)
BEST SYSTEM	AUTO PICTURE	ACTIVE VIDEO CAL.	ACTIVE VIDEO CAL.
CHILD LOCK	×	○	○

NOTE : × NOT USED ○ USED

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. *Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.*

2. Parts identified by the ⚠ symbol and shaded (▒) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various *regulations regarding spurious radiation* emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:

1) Insulation Tape	3) Spacers	5) Barrier
2) PVC tubing	4) Insulation sheets for transistors	

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

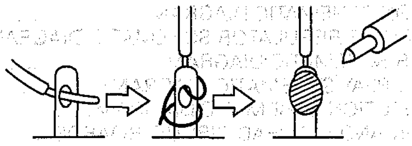


Fig.1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

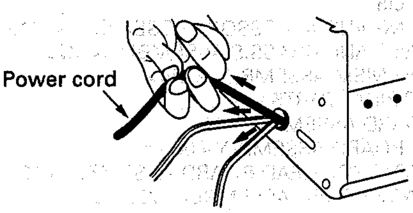


Fig.2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) **Connector part number :** E03830-001
    2) **Required tool :** Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

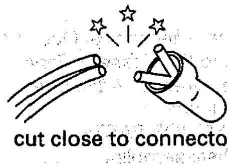


Fig.3

(2) *Strip about 15 mm of the insulation from the ends of* the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

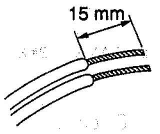


Fig.4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

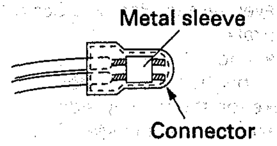


Fig.5

(4) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

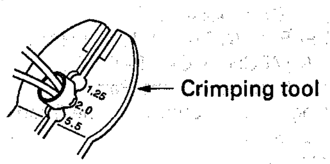


Fig.6

(5) Check the four points noted in Fig.7.

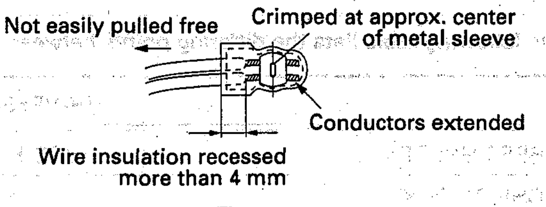

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig.7

• Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

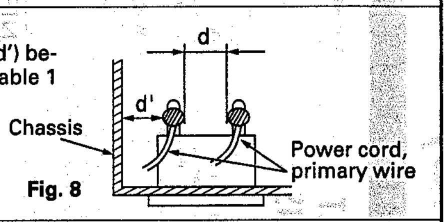


Fig. 8

4. **Leakage current test**
Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
Measuring Method : (Power ON)
Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

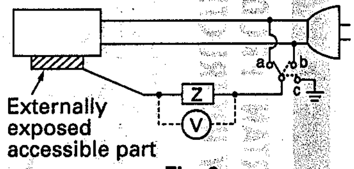


Fig. 9

5. **Grounding (Class I model only)**
Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
Measuring Method:
Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

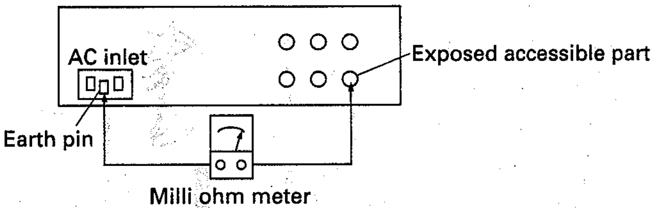


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 miute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 1 kV 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ/500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

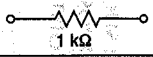
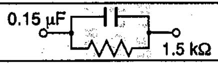
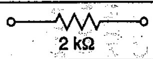
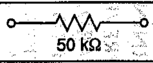
AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan		i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada		i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia		i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
			i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

INSTRUCTIONS (HR-VP654U)

Dear Customer,
Thank you for purchasing the JVC VHS video cassette recorder. Before use, please read the safety information and precautions contained in the following pages to ensure safe use of your new VCR.

CAUTIONS

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK.
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

CAUTION:
This video cassette recorder should be used with AC 120V∿, 60Hz only.
To prevent electric shocks and fire hazards, DO NOT use any other power source.

CAUTION:
TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION:
POUR ÉVITER LES CHOCS ÉLECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU'AU FOND.

Note to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

CAUTION:
Changes or modifications not approved by JVC could void user's authority to operate the equipment.

Failure to heed the following precautions may result in damage to the VCR, remote control or video cassette.

1. **DO NOT place the VCR . . .**
   - ... in an environment prone to extreme temperatures or humidity.
   - ... in direct sunlight.
   - ... in a dusty environment.
   - ... in an environment where strong magnetic fields are generated.
   - ... on a surface that is unstable or subject to vibration.
2. **DO NOT block the VCR's ventilation openings.**
3. **DO NOT place heavy objects on the VCR or remote control.**
4. **DO NOT place anything which might spill on top of the VCR or remote control.**
5. **AVOID violent shocks to the VCR during transport.**

**MOISTURE CONDENSATION

Moisture in the air will condense on the VCR when you move it from a cold place to a warm place, or under extremely humid conditions—just as water droplets form on the surface of a glass filled with cold liquid. Moisture condensation on the head drum will cause damage to the tape. In conditions where condensation may occur, keep the VCR's power turned on for a few hours to let the moisture dry before inserting a tape.

**ABOUT HEAD CLEANING

Accumulation of dirt and other particles on the video heads may cause the playback picture to become blurred or interrupted. Be sure to contact your nearest JVC dealer if such troubles occur.

VCR Plus+C^3 and PlusCode are trademarks of Gemstar Development Corporation.
The VCR Plus+ system is manufactured under license from Gemstar Development Corporation.

DSS™ is an official trademark of DIRECTV, Inc., a unit of GM Hughes Electronics. PRIMESTAR is a registered service mark of Primestar Partners, L.P. DISH Network™ is a trademark of Echostar Communications Corporation.

MOVIE ADVANCE™ is a trademark of SRT, Inc. A Jerry Iggulden invention licensed in association with Arthur D. Little Enterprises, Inc.

VHS SQPB HQ

- Cassettes marked "VHS" (or "S-VHS") can be used with this video cassette recorder. However, S-VHS recording is not possible with this model.
- This model is equipped with SQPB (S-VHS QUASI PLAYBACK) that makes it possible to play back S-VHS recordings with regular VHS resolution.
- HQ VHS is compatible with existing VHS equipment.
- As an ENERGY STAR® Partner, JVC has determined that this product or product model meets the ENERGY STAR® guidelines for energy efficiency.

IMPORTANT PRODUCT SAFETY INSTRUCTIONS

Electrical energy can perform many useful functions. But improper use can result in potential electrical shock or fire hazards. This product has been engineered and manufactured to assure your personal safety. In order not to defeat the built-in safeguards, observe the following basic rules for its installation, use and servicing.

ATTENTION:
Follow and obey all warnings and instructions marked on your product and its operating instructions. For your safety, please read all the safety and operating instructions before you operate this product and keep this booklet for future reference.

INSTALLATION

1. Grounding or Polarization

(A) Your product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature.
If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

(B) Your product may be equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature.
If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

2. Power Sources
Operate your product only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. If your product is intended to operate from battery power, or other sources, refer to the operating instructions.

3. Overloading
Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.

4. Power Cord Protection
Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

5. Ventilation
Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered.

- Do not block the openings by placing the product on a bed, sofa, rug or other similar surface.
- Do not place the product in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

6. Wall or Ceiling Mounting
The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

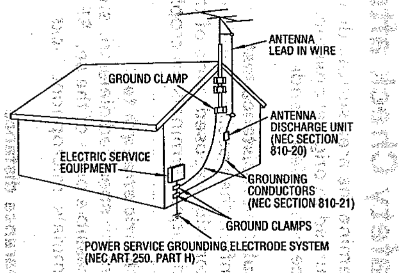
ANTENNA INSTALLATION INSTRUCTIONS

1. Outdoor Antenna Grounding
If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding connectors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

2. Lightning
For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.

3. Power Lines
An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE, ANSI/NFPA 70


ANTENNA LEAD IN WIRE
GROUND CLAMP
ANTENNA DISCHARGE UNIT (NEC SECTION 810-20)
ELECTRIC SERVICE EQUIPMENT
GROUNDING CONDUCTORS (NEC SECTION 810-21)
GROUND CLAMPS
POWER SERVICE GROUNDING ELECTRODE SYSTEM (NEC ART 250. PART H)

NEC – NATIONAL ELECTRICAL CODE

USE

1. Accessories
To avoid personal injury:
- Do not place this product on an unstable cart, stand, tripod, bracket, or table. It may fall, causing serious injury to a child or adult, and serious damage to the product.
- Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer or sold with the product.
- Use a mounting accessory recommended by the manufacturer and follow the manufacturer's instructions for any mounting of the product.
- Do not try to roll a cart with small casters across thresholds or deep-pile carpets.

2. Product and Cart Combination
A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

PORTABLE CART WARNING
(Symbol provided by RETAC)

3. Water and Moisture
Do not use this product near water—for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool and the like.

4. Object and Liquid Entry
Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

5. Attachments
Do not use attachments not recommended by the manufacturer of this product as they may cause hazards.

6. Cleaning
Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

7. Heat
The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

SERVICING

1. Servicing
If your product is not operating correctly or exhibits a marked change in performance and you are unable to restore normal operation by following the detailed procedure in its operating instructions, do not attempt to service it yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

2. Damage Requiring Service
Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
a. When the power supply cord or plug is damaged.
b. If liquid has been spilled, or objects have fallen into the product.
c. If the product has been exposed to rain or water.
d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
e. If the product has been dropped or damaged in any way.
f. When the product exhibits a distinct change in performance—this indicates a need for service.

3. Replacement Parts
When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

4. Safety Check
Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in safe operating condition.

HOW TO USE THIS INSTRUCTION MANUAL

- All major sections and subsections are listed in the Table Of Contents on page 5. Use this when searching for information on a specific procedure or feature.
- The Index on pages 56–59 lists frequently-used terms, and the number of the page on which they are used or explained in the manual. This section also illustrates the controls and connections on the front and rear panel, the front display panel and the remote control.
- The ☞ mark signals a reference to another page for instructions or related information.
- Operation buttons necessary for the various procedures are clearly indicated through the use of illustrations at the beginning of each major section.

BEFORE YOU INSTALL YOUR NEW VCR . . .

. . . please read the sections/literature listed below.
- "Cautions" on page 2
- "Important Products Safety Instructions" on the previous pages

CONTENTS

INSTALLING YOUR NEW VCR 6
Basic Connections 6

INITIAL SETTINGS 8
Plug & Play 8
Language 10
Clock 11
Preparation 11
Semi-Auto 12
Manual 13
Tuner 14
Set Receivable Channels 14
Add Or Delete A Channel 15
Cable Box Control 16
Situate And Connect Controller 16
Set Cable Box Output Channel & Cable Box Brand 17
DBS Receiver Control 19
Situate And Connect Controller 19
Set DBS Receiver Output Channel & DBS Receiver Brand 20

SIMPLE PLAYBACK AND RECORDING 22
Simple Playback 22
Simple Recording 23

PLAYBACK AND RECORDING FEATURES 24
Playback Features 24
Still Picture/Frame-By-Frame Playback 24
Slow Motion/Reverse Slow Motion 24
Variable-Speed Search/Reverse Motion Playback 24
High-Speed Search 25
Skip Search 25
Index Search 25
Instant ReView 25
Manual Tracking 25
Video Stabilizer 26
Repeat Playback 27
Counter Reset 27
Tape Position Indicator 27
Next-Function Memory 27
Superimpose 28
Select The Soundtrack 29
Movie Advance 30
AV COMPU LINK Playback 31
Auto Picture 32
Preparation 32
Playback 33
Recording Features 34
Record One Program While Watching Another 34
Display Elapsed Recording Time 34
Stereo And SAP (Second Audio Program) 35
To Record SAP Programs 35

TIMER RECORDING 36
VCR Plus+ Timer Programming 36
VCR Plus+ Setup 38
Express Timer Programming 40
Check, Cancel And Revise Programs 42
Auto SP→EP Timer 43
Auto Timer 43
Instant Timer Recording (ITR) 44

EDITING 45
Edit To Or From Another VCR 45
Edit From A Camcorder 46

SPECIAL FEATURES 48
TV Multi-Brand Remote Control 48
Cable Box Multi-Brand Remote Control 49
DBS Receiver Multi-Brand Remote Control 50
Control Two JVC VCRs 51

TROUBLESHOOTING 52
Power 52
Tape Transport 52
Playback 52
Recording 52
Timer Recording 53
Other Problems 54

QUESTIONS AND ANSWERS 55
Playback 55
Recording 55
Timer Recording 55

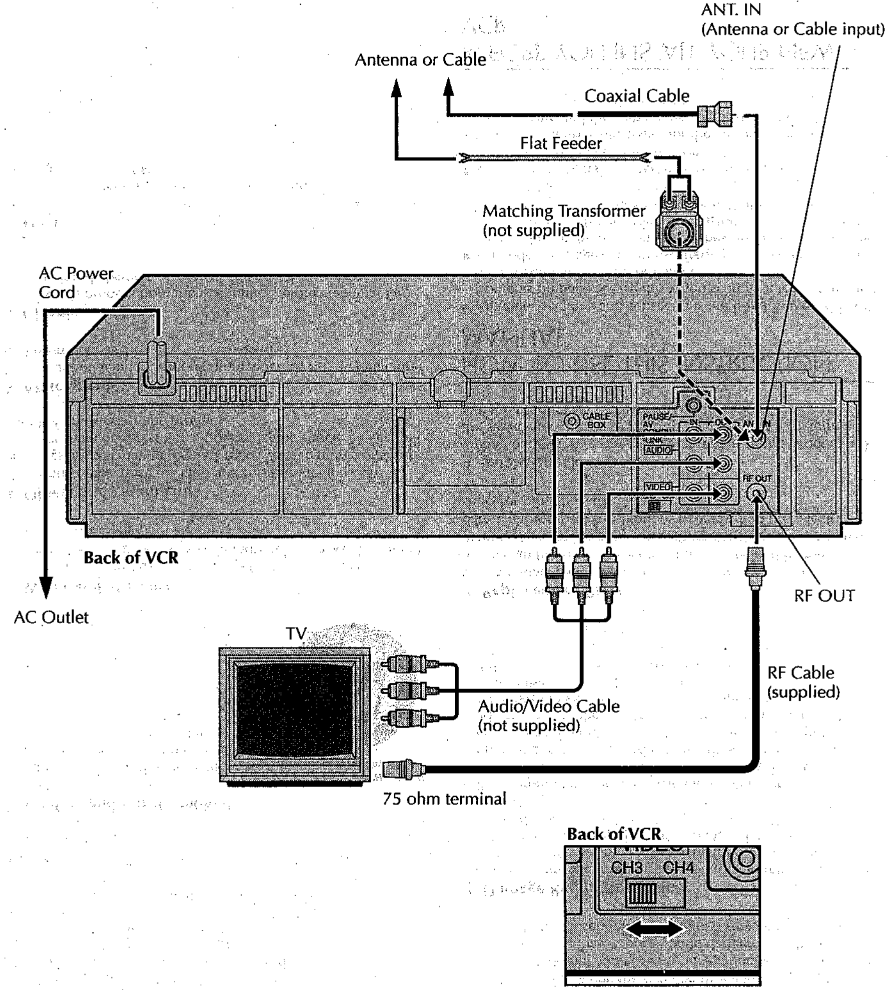
INDEX 56
List Of Terms 56
Front View 57
Rear View 58
Front Display Panel 58
Remote Control 59

SPECIFICATIONS 60

FOR SERVICING (Only in U.S.A.) 61

WARRANTY (Only in U.S.A.) 62

Basic Connections


ANT. IN
(Antenna or Cable input)
Antenna or Cable
Coaxial Cable
Flat Feeder
Matching Transformer
(not supplied)
AC Power
Cord
CABLE BOX
PAUSE/AV
LINK
AUDIO
VIDEO
RF OUT
Back of VCR
AC Outlet
RF OUT
TV
RF Cable
(supplied)
Audio/Video Cable
(not supplied)
75 ohm terminal
Back of VCR
CH3 CH4

1 CHECK CONTENTS

Make sure the package contains all of the accessories listed in "SPECIFICATIONS" (☞ pg. 60).

2 SITUATE VCR

Place the VCR on a stable, horizontal surface.

3 CONNECT VCR TO TV

The connection method you use depends on the type of TV you have.

RF Connection

- *To Connect To A TV With NO AV Input Terminals . . .*
  - **a–** Disconnect the TV antenna from the TV.
  - **b–** Connect the TV antenna cable to the ANT. IN jack on the rear of the VCR.
  - **c–** Connect the supplied RF cable between the RF OUT jack on the rear of the VCR and the TV's antenna terminal. Set TV on CH3 or CH4 corresponding to the CH3 – CH4 switch setting on the back of the VCR.

AV Connection

- *To Connect To A TV With AV Input Terminals . . .*
  - **a–** Connect the antenna, VCR and TV as shown in the illustration.
  - **b–** Connect an Audio/Video Cable between the AUDIO OUT and VIDEO OUT jacks on the rear of the VCR and the AV IN jacks on the TV. Set your TV in video input mode or A/V input mode. Refer to the TV Instruction Manual.

4 CONNECT VCR TO POWER SOURCE

Connect the power plug to an AC outlet.

- The clock and tuner channels will automatically be set when the antenna is connected and when the AC is first connected to the VCR (☞ pg. 8).
  (If "Auto" or "CH" is displayed on the front display panel before the VCR is powered on, the clock and tuner channels are being set automatically. Wait for the time to be displayed on the front display panel before powering on the VCR.)

5 FINAL PREPARATION FOR USE

Power on the VCR and select the VCR channel (3 or 4) by setting the switch on the rear of the VCR as shown in the illustration.
You can now perform simple playback (☞ pg. 22) or simple recording (☞ pg. 23).

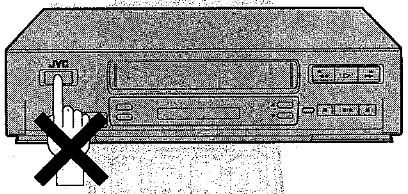
NOTES:

- *The VCR channel is the channel on the TV which will display the audio and video signals from the VCR. The VCR's CH3-CH4 switch, on the back of the VCR, sets the VCR channel to CH3 or CH4.*
- *The CH3–CH4 switch is preset to the CH3 position.*
  Set to CH4 if CH3 is used for broadcasting in your area and set the channel on the TV to correspond to the VCR's CH3–CH4 switch setting.
- *If RF connection to TV is used, when switching from VCR to TV mode and from TV to VCR it may be necessary to issue a CH UP and then CH DOWN on TV to obtain a good quality picture.*
- *Even if you are using AV cables to connect your VCR to your TV, you must also connect it using the RF cable. This will ensure that you can record one show while watching another (☞ pg. 34).*
- *For full identification of the VCR's rear panel, refer to the Index (REAR VIEW ☞ pg. 58).*

Plug & Play

Auto Clock Set/Auto Tuner Set

ATTENTION
If you use a cable box, Plug & Play will not function; set the clock and tuner channels manually. (☞ pg.11 – 15)



IMPORTANT
- Don't press any buttons on the VCR or remote while Plug & Play is in progress.
- If you perform Plug & Play successfully, there's no need to perform the Clock (☞ pg. 11) and Tuner (☞ pg. 14) procedures. If, however, you want to add or delete channels, refer to "Add Or Delete A Channel" on page 15.

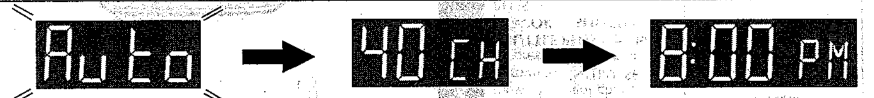
The Plug & Play function sets the clock and tuner channels automatically when power is first connected to the VCR. The antenna cable must be connected for the Plug & Play function.

The time and date can be set automatically from clock setting data that is transmitted by one of the regular TV broadcast channels. We call this TV channel the "Host Channel" and it is a PBS channel in your area.

1 PLUG & PLAY SETUP

Connect the antenna cable to the VCR (☞ pg. 6). Then connect the VCR's power plug to an AC outlet. Do not power on the VCR. The clock and tuner channels will be set automatically.

NOTES:
- Auto clock set is performed first. The auto clock set function scans all the channels received by your VCR to find the Host Channel and then sets the clock. "Auto" blinks on the front display panel during Auto clock set.
- Auto channel set is performed next. The auto channel set function scans all the channels that are receivable by your VCR. It then automatically assigns each receivable channels to the **CH▲▼** (+/–) buttons. It skips non-receivable channels. During auto channel set the channel numbers are displayed as they are scanned and set.
- When Plug & Play has been completed successfully the correct time is displayed.
- If an incorrect time or "– –:– –" appears on the display panel, see "What To Do If Plug & Play Has Failed" on next page.



During Initial Auto Clock Set
"Auto" blinks.

During Auto Channel Set
The channel numbers are displayed as they are scanned and set.

Plug & Play Completed
The current time (including AM/PM) is displayed.

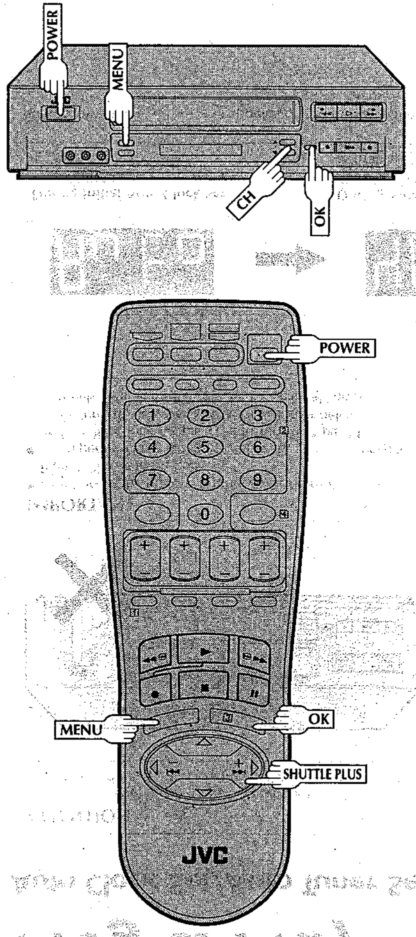
* If an incorrect time or "– –:– –" appears on the display panel, see "What To Do If Plug & Play Has Failed" on next page.

INFORMATION
- If "AUTO CLOCK" is set to "ON" at the Clock Set screen on page 12, the clock will be adjusted automatically by the host channel every hour on the hour (except for 11:00 PM, midnight, 1:00 AM and 2:00 AM) by the incoming PBS channel clock setting data. (This automatic clock adjustment can only be performed when the VCR's power is turned off. The clock will be adjusted on the hour based on the time displayed on the VCR, not on the actual real time.) The default setting of "AUTO CLOCK" is "ON".
- If the memory backup fails, because of a power outage or because the AC was removed from the VCR, Plug & Play will be performed when power is restored to the VCR.

What To Do If Plug & Play Has Failed
- If an incorrect time is displayed on the front display panel, you may be receiving the clock setting data of a PBS channel from an adjacent time zone, or an incorrect PBS channel from a cable TV system. In this case, perform the Semi-Auto (☞ pg. 12) or Manual Clock Set (☞ pg. 13) procedure. Auto channel set has already taken place and it need not be set again.
- If "- -:- -" appears on the display, your antenna cable may not be connected to the VCR or there may not be a Host PBS signal available in your area. Ensure that the antenna cable is connected correctly. Then power on and power off the VCR; the Plug & Play function will be automatically reactivated and "Auto" will be displayed on the VCR's front panel. If Plug & Play is not performed but the antenna cable is connected correctly, perform the Manual Clock Set procedure (☞ pg. 13). Auto channel set has not yet taken place, so please also perform the "Set Receivable Channels" procedure (☞ pg. 14).

Language

Turn on the TV and select the VCR channel 3 or 4 (or AV mode).



This VCR offers you the choice to view on-screen messages in English, Spanish or French (not including messages superimposed on the TV picture). Select the desired language using this procedure. The default setting is "ENGLISH".

1 TURN ON THE VCR

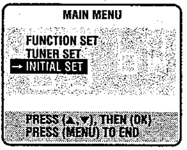
Press **POWER**.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

3 ACCESS INITIAL SET SCREEN

At the Main Menu screen, move the highlight bar (arrow) to "INITIAL SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.



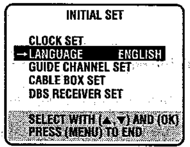
MAIN MENU

FUNCTION SET
TUNER SET
→ INITIAL SET

PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

4 SELECT LANGUAGE

Move the highlight bar (arrow) to "LANGUAGE" by pressing **CH ▲▼** or **SHUTTLE PLUS** △▽, then press **OK** or **SHUTTLE PLUS** ▷ to select the desired language.



INITIAL SET

CLOCK SET
→ LANGUAGE ENGLISH
GUIDE CHANNEL SET
CABLE BOX SET
DBS RECEIVER SET

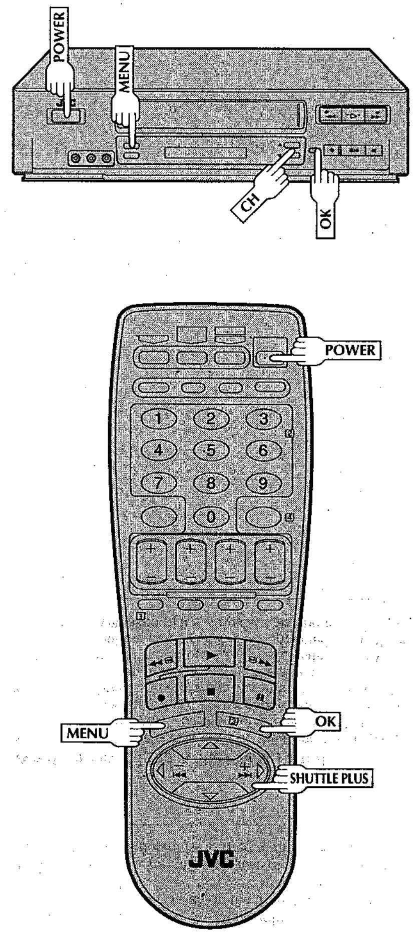
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

5 RETURN TO NORMAL SCREEN

Press **MENU**.

Clock

Turn on the TV and select the VCR channel 3 or 4 (or AV mode).



Perform clock setting only if the clock has not been set correctly by the Plug & Play function or you use a cable box. Access the Clock Set screen to perform the Semi-Auto or Manual clock setting procedure. Each procedure starts from step **5**.
If you use a cable box, set the clock manually. (☞ pg. 13)

Preparation

1 TURN ON THE VCR

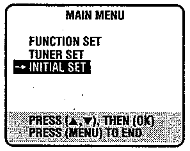
Press **POWER**.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

3 ACCESS INITIAL SET SCREEN

At the Main Menu screen, move the highlight bar (arrow) to "INITIAL SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.



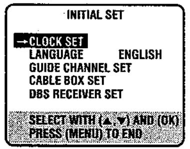
MAIN MENU

FUNCTION SET
TUNER SET
→ INITIAL SET

PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

4 ACCESS CLOCK SET SCREEN

Move the highlight bar (arrow) at the Initial Set screen to "CLOCK SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.

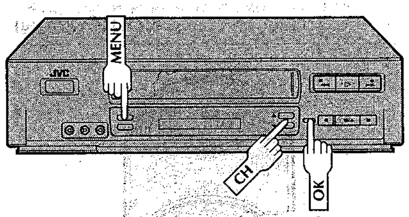


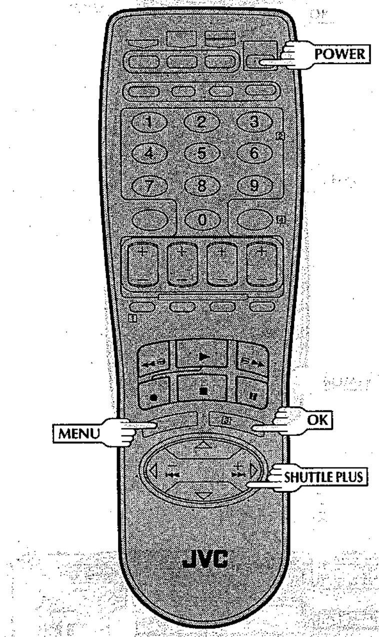
INITIAL SET

→ CLOCK SET
LANGUAGE ENGLISH
GUIDE CHANNEL SET
CABLE BOX SET
DBS RECEIVER SET

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

- "CABLE BOX USERS SET CLOCK MANUALLY" appears on the screen for about 5 seconds, then the Clock Set screen appears.





Semi-Auto

You can change the Host Channel/D.S.T. /Time Zone setting manually.

5

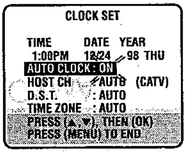
SET AUTO CLOCK TO ON

At the Clock Set screen, press **OK** or **SHUTTLE PLUS** ▷ to move the highlight bar to "AUTO CLOCK" and press **CH ▲▼** or **SHUTTLE PLUS** △▽ to set to "ON".

a– To select the Host Channel — go to step **6**

b– To select the D.S.T. mode — go to step **7**

c– To select the Time Zone — go to step **8**



```
CLOCK SET

TIME        DATE  YEAR
 1:00PM    12/24  98 THU
AUTO CLOCK : ON
HOST CH     : AUTO   (CATV)
D.S.T.      : AUTO
TIME ZONE   : AUTO
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END
```

NOTE:

The time that has been set previously will be erased when "AUTO CLOCK", "HOST CH", "D.S.T." or "TIME ZONE" setting is changed.

6

SELECT HOST CHANNEL

You can either select "AUTO" or enter a PBS channel number. Move the highlight bar to "HOST CH" by pressing **OK** or **SHUTTLE PLUS** ▷, then press **CH ▲▼** or **SHUTTLE PLUS** △▽ to set to "AUTO" or the desired PBS channel number.

NOTE:

There are some PBS channels that do not transmit clock setting data.

7

SELECT D.S.T. MODE

You have three choices:

a– Select "AUTO" and the adjustment to your VCR's clock will be made according to the incoming signal from the host channel.

b– Select "ON" and the adjustment will be made based on the clock itself.

c– Select "OFF" if Daylight Saving Time does not apply to you.

Move the highlight bar to "D.S.T." by pressing **OK** or **SHUTTLE PLUS** ▷, then press **CH ▲▼** or **SHUTTLE PLUS** △▽ to select the desired mode.

****AUTO DAYLIGHT SAVING TIME**

This function enables automatic adjustment of the VCR's clock at the start and end of Daylight Saving Time.

With Auto DST activated, . . .

. . . on the first Sunday of April at 2:00 AM, the clock is adjusted to 3:00 AM.

. . . on the last Sunday of October at 2:00 AM, the clock is adjusted to 1:00 AM.

8

SELECT TIME ZONE

You can select the time zone automatically or manually. Move the highlight bar to "TIME ZONE" by pressing **OK** or **SHUTTLE PLUS** ▷, then press **CH ▲▼** or **SHUTTLE PLUS** △▽ to select "AUTO" or the desired time zone.

AUTO → ATLANTIC
HAWAII
EASTERN
ALASKA
CENTRAL
PACIFIC
MOUNTAIN

NOTE:

If an incorrect time is displayed by the Plug & Play function, you may be receiving the clock setting data of a PBS channel from an adjacent time zone or from an incorrect PBS channel from a cable TV system. If you selected "AUTO" for the host channel in step ***6****, be sure to select the correct time zone manually.*

9

RETURN TO NORMAL SCREEN

Press **MENU**.

IMPORTANT

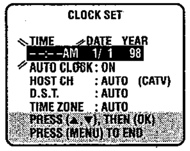
Turn the VCR off after performing the Semi-Auto Clock Set procedure. "Auto" will appear on the front display panel when the clock is being set. The current time will appear automatically when the clock is set.

Manual

5

SET TIME

Press **CH ▲▼** or **SHUTTLE PLUS** △▽ until the desired time appears, then press **OK** or **SHUTTLE PLUS** ▷.



```
CLOCK SET

TIME        DATE  YEAR
--:--AM     1/ 1   98
AUTO CLOCK : ON
HOST CH     : AUTO   (CATV)
D.S.T.      : AUTO
TIME ZONE   : AUTO
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END
```

- Press and hold **CH ▲▼** or **SHUTTLE PLUS** △▽ to change the time by 30 minutes.
- When the time is entered manually, "AUTO CLOCK" will be automatically set to "OFF", and "HOST CH" and "TIME ZONE" will disappear.

6

SET DATE

Press **CH ▲▼** or **SHUTTLE PLUS** △▽ until the desired date appears, then press **OK** or **SHUTTLE PLUS** ▷.

- Press and hold **CH ▲▼** or **SHUTTLE PLUS** △▽ to change the date by 15 days.

7

SET YEAR

Press **CH ▲▼** or **SHUTTLE PLUS** △▽ until the desired year appears, then press **OK** or **SHUTTLE PLUS** ▷ twice.

8

SELECT D.S.T. MODE

Press **CH ▲▼** or **SHUTTLE PLUS** △▽ to select the desired mode.

a– Set to "ON" so that the adjustment to your VCR's clock will be made on the clock itself.

b– Set to "OFF" if Daylight Saving Time does not apply to you.

9

START CLOCK

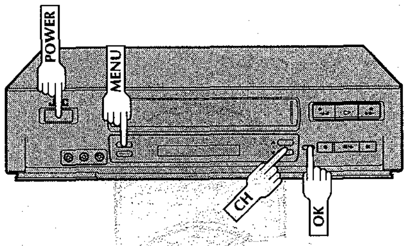
Press **MENU** and normal screen appears.

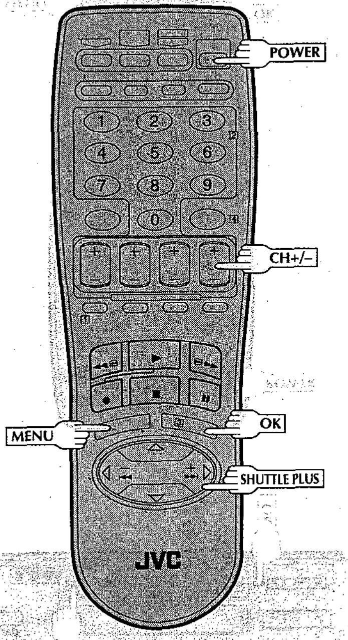
To Make Corrections

Press **OK** or **SHUTTLE PLUS** ▷ until the item you want to change blinks, then press **CH ▲▼** or **SHUTTLE PLUS** △▽.

Tuner

Turn on the TV and select the VCR channel 3 or 4 (or AV mode).





INFORMATION
The VCR detects the band (TV or CATV) and selects the correct band automatically during Auto Channel Set.
The selected band will be displayed on the right side of "BAND" on the Tuner Set screen.

Set Receivable Channels

1 TURN ON THE VCR

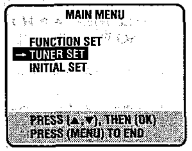
Press **POWER**.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

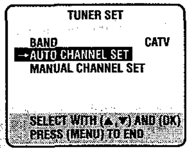
3 ACCESS TUNER SET SCREEN

Move the highlight bar (arrow) to "TUNER SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.

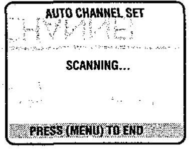

MAIN MENU
FUNCTION SET
→ TUNER SET
INITIAL SET
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

4 PERFORM AUTO CHANNEL SET

Move the highlight bar (arrow) to "AUTO CHANNEL SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.


TUNER SET
BAND CATV
→ AUTO CHANNEL SET
MANUAL CHANNEL SET
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

- Receivable channels in your area are automatically assigned to the **CH▲▼** (+/–) buttons, and non-receivable channels are skipped.

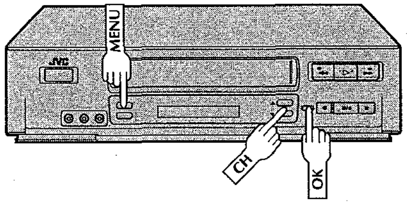

AUTO CHANNEL SET
SCANNING...
PRESS (MENU) TO END

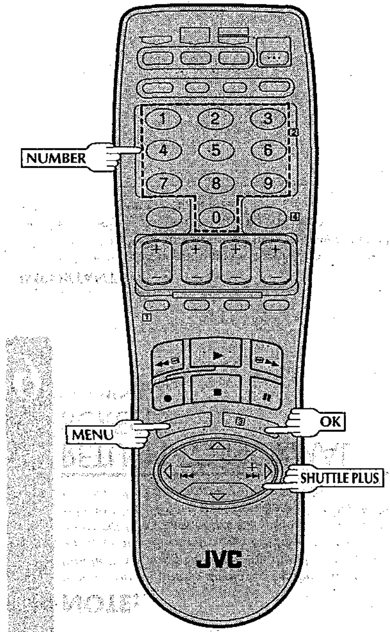
NOTES:

- *At the end of Auto Channel Set, "SCAN COMPLETED" appears on screen.*
- *If the scan was unsuccessful, "SCAN COMPLETED–NO SIGNAL" appears on screen. Check the connections and start again.*

5 RETURN TO NORMAL SCREEN

Press **MENU**.





Add Or Delete A Channel

1 ACCESS MAIN MENU SCREEN

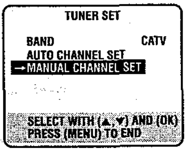
Press **MENU**.

2 ACCESS TUNER SET SCREEN

Move the highlight bar (arrow) to "TUNER SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.

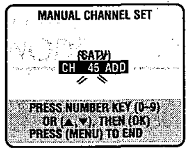
3 ACCESS MANUAL CHANNEL SET SCREEN

Move the highlight bar (arrow) to "MANUAL CHANNEL SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.


TUNER SET
BAND CATV
AUTO CHANNEL SET
→ MANUAL CHANNEL SET
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

4 ADD OR SKIP DESIRED CHANNEL

Input the channel number using the **NUMBER** keys or by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷ to set to "ADD" or "SKIP" as required. Repeat for each channel you want to add or skip.


MANUAL CHANNEL SET
(CATV)
CH 45 ADD
PRESS NUMBER KEY (0–9)
OR (▲,▼), THEN (OK)
PRESS (MENU) TO END

5 RETURN TO NORMAL SCREEN

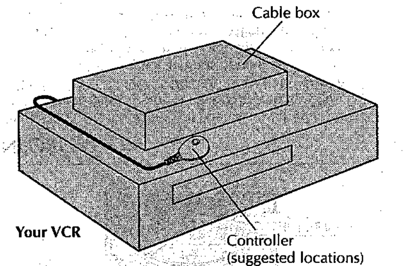
Press **MENU**.

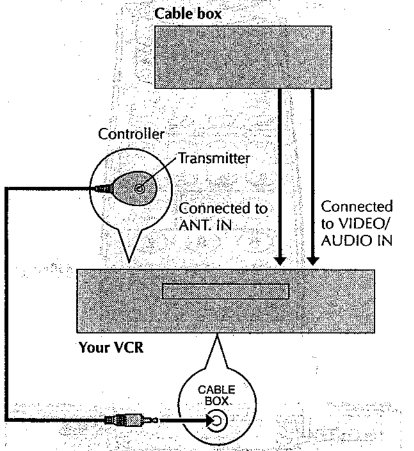
Cable Box Control

Suggested Location
Place the cable box on top of the VCR. Attach the VCR's Controller to the top of the VCR with the Controller's transmitter pointed towards the cable box's remote sensor.

Attention:

The Controller can also control a DBS receiver. If both a cable box and a DBS receiver are used, position the controller so its signal reaches the remote control sensors of both the cable box and DBS receiver.





This procedure is required if you receive your TV channels through a cable box (descrambler). The Controller allows the VCR to automatically switch the cable box channel during timer-recording. The Controller is effective for recording shows that have been programmed using VCR Plus+ (☞ pg. 36) or Express Timer Programming (☞ pg. 40).

Situate And Connect Controller

1 SITUATE CONTROLLER

Place the Controller so that the path between its transmitter and the cable box's remote sensor is unobstructed.

2 ATTACH CONTROLLER

Fasten securely using the supplied adhesive strip.

3 CONNECT CABLE BOX TO VCR

The connection method depends on the type of cable box you have.

If your cable box has AUDIO and VIDEO OUT connectors . . .
. . . connect them to the AUDIO and VIDEO IN connectors on your VCR. Set the VCR to channel "L-1" for the rear AUDIO and VIDEO IN connectors, or channel "F-1" for the front AUDIO and VIDEO IN connectors to use the cable box.
If your cable box doesn't have AUDIO and VIDEO OUT connectors . . .
. . . connect the antenna output connector on the cable box to the ANT. IN connector on the rear of your VCR. Set the VCR tuner to the same channel as the cable box RF output (see page 17 also).

NOTE:
When connecting your cable box refer to its instruction manual.

4 CONNECT CONTROLLER TO VCR

Connect to the CABLE BOX connector on your VCR.

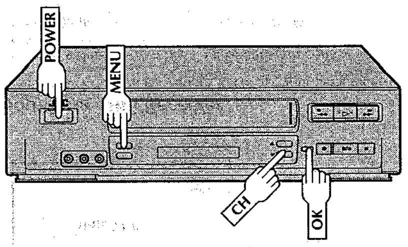
About Your Cable Box

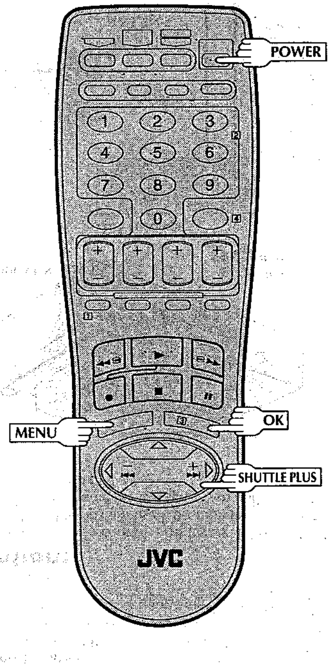
This VCR has two separate methods to control your Cable Box.

- *The VCR's Wireless Remote Control Unit can control your Cable Box.*
  This eliminates the need for a separate Cable Box Remote Control Unit.
- *The VCR's Controller can also control your Cable Box.*
  This allows the VCR to change your Cable Box's channel number during timer recording.

Each method must be set up separately. To set up the VCR's Remote Control unit, refer to page 49. To set up the Controller go to page 17.

Turn on the TV and select the VCR channel 3 or 4 (or AV mode).





Set Cable Box Output Channel & Cable Box Brand

1 TURN ON CABLE BOX

Select a channel other than channel 9 on your cable box.

2 TURN ON THE VCR

Press **POWER**.

3 ACCESS MAIN MENU SCREEN

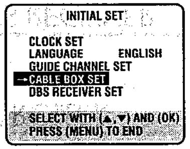
Press **MENU**.

4 ACCESS INITIAL SET SCREEN

Press **CH▲▼** or **SHUTTLE PLUS**△▽ to move the highlight bar (arrow) to "INITIAL SET", then press **OK** or **SHUTTLE PLUS ▷**.

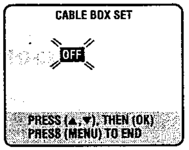
5 ACCESS CABLE BOX SET SCREEN

Press **CH▲▼** or **SHUTTLE PLUS**△▽ to move the highlight bar (arrow) to "CABLE BOX SET", then press **OK** or **SHUTTLE PLUS ▷**.


INITIAL SET
CLOCK SET
LANGUAGE ENGLISH
GUIDE CHANNEL SET
→CABLE BOX SET
DBS RECEIVER SET
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

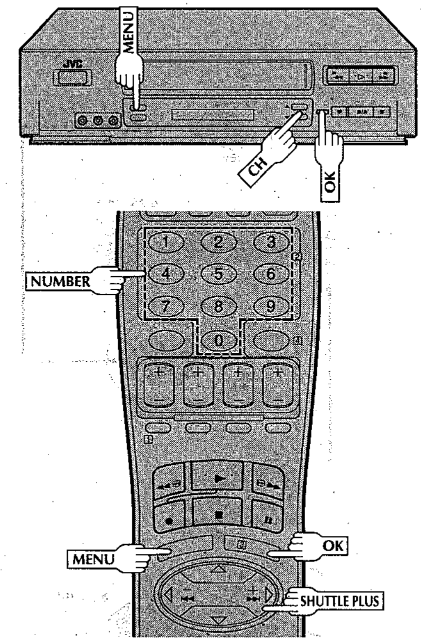
6 SELECT CABLE BOX OUTPUT CHANNEL

Your selection depends on how your cable box is connected to your VCR.


CABLE BOX SET
OFF
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

If your cable box is connected to your VCR using an RF connection . . .
. . . press **CH ▲▼** or **SHUTTLE PLUS** △▽ until the channel number representing the cable box's output (CH2 – CH9) appears on the screen.
If your cable box is connected to your VCR's FRONT AUDIO/VIDEO IN connectors . . .
. . . press **CH ▲▼** or **SHUTTLE PLUS** △▽ until "ON F-1 (FRONT)" appears on the screen.
If your cable box is connected to your VCR's REAR AUDIO/VIDEO IN connectors . . .
. . . press **CH ▲▼** or **SHUTTLE PLUS** △▽ until "ON L-1 (REAR)" appears on the screen.

CONTINUED ON NEXT PAGE.



INFORMATION

When the VCR's clock has not been set (with AUTO CLOCK set to ON), if you press **OK** in step 7, "CABLE BOX USERS SET CLOCK MANUALLY" will be displayed on the screen for about 5 seconds, then the Clock Set screen will appear; perform the manual clock setting procedure on page 13. If you press **MENU** after the clock has been set, the Cable Box Brand Set screen appears.

NOTES:

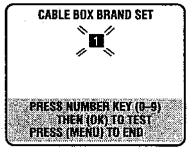
- *Although the supplied Controller is compatible with many different cable box brands, it is possible that it will not work with your cable box.*
- *If your cable box doesn't respond to any code between 1 and 25, you can't use the Controller to change cable box channels. In this case, make sure to leave the cable box turned on and tuned to the proper channel before the scheduled start of timer recording.*
  Please contact your cable company about the possibility of exchanging your current cable box with one that is compatible with your VCR.
- *The VCR can only change the cable box channel through the Controller during timer recording.*
- *If your cable box is one that can't be operated with a remote control (because it has no remote sensor), you can't use the Controller to change its channels. Make sure to leave the cable box turned on and tuned to the proper channel before the scheduled start of timer recording.*
- ***For customers in U.S.A.:** If you are unable to set the Controller, please contact JVC toll free at 1-800-252-5722.*

7 ACCESS CABLE BOX BRAND SET SCREEN

Press **OK**.

8 ENTER CABLE BOX BRAND

Press the appropriate **NUMBER** keys to enter the Cable Box Code from the CABLE BOX BRAND LIST shown below, then press **OK**.



- If the cable box's channel changes to 9, setting is complete. Press **OK** and "CABLE BOX CONTROL IS ON" appears on the screen for about 5 seconds, then it returns to the normal screen.
- If the cable box's channel does not change to 9, press **CH ▲▼** or **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "NO", then press **OK**. By entering another code, repeat step **8** until the cable box's channel changes to 9.
- If the channel does not change after going through all the code numbers listed for your model of cable box, then try all the other numbers between 1 and 25.

CABLE BOX BRAND LIST

BRAND	CODE
ARCHER	1, 5, 17
CABLETENNA	1, 17
CABLEVIEW	15, 16, 17, 21, 25
CITIZEN	15, 16, 17, 21, 25
CURTIS	2, 8
DIAMOND	1, 17
EASTERN	19
GC BRAND	15, 16, 17, 21, 25
GEMINI	15
GENERAL INSTRUMENTS	1, 4, 6, 11, 12, 15
HAMLIN	10, 18, 19, 23
JASCO	15
JERROLD	1, 4, 6, 11, 12, 15
NOVAVISION	2, 8
OAK	7, 20
PANASONIC	13, 14
PULSER	15, 16, 17, 21, 25
RCA	13, 14
REGAL	10, 18, 19, 23
REGENCY	19
REMBRANDT	1, 16, 17
SAMSUNG	5, 16, 24
SCIENTIFIC ATLANTA	2, 8
SIGMA	7, 20
SL MARX	5, 16, 17, 24, 25
SPRUCER	13, 14
STARGATE	5, 15, 16, 17, 21, 24, 25
TELEVIEW	5, 16, 24
TOCOM	1, 4, 16
UNIKA	1, 17
UNIVERSAL	16, 17, 25
VIDEOWAY	3, 9, 22
ZENITH	3, 9, 22

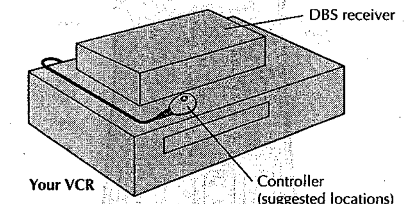
DBS Receiver Control

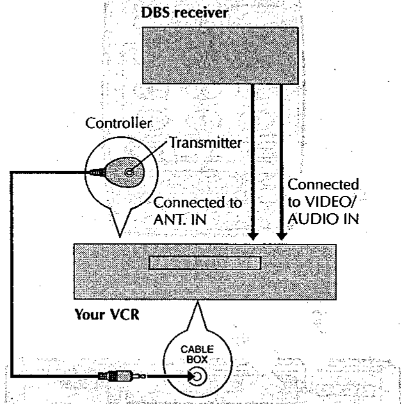
Suggested Location

Place the DBS (Direct Broadcast Satellite) receiver on top of the VCR. Attach the VCR's Controller to the top of the VCR with the Controller's transmitter pointed towards the DBS receiver's remote sensor.

Attention:

The Controller can also control a cable box. If both a DBS receiver and a cable box are used, position the controller so its signal reaches the remote control sensors of both the DBS receiver and cable box.





About Your DBS Receiver

This VCR has two separate methods to control your DBS Receiver.

- *The VCR's Wireless Remote Control Unit can control your DBS Receiver.*
  This eliminates the need for a separate DBS Receiver Remote Control Unit.
- *The VCR's Controller can also control your DBS Receiver.*
  This allows the VCR to change your DBS receiver's channel number during timer recording.

Each method must be set up separately. To set up the VCR's Remote Control unit, refer to page 50. To set up the Controller go to page 20.

The following procedure is required if you receive satellite channels through a DBS (Direct Broadcast Satellite) Receiver. The Controller allows the VCR to automatically switch the DBS Receiver's channels during timer recording.

NOTES:

- *The VCR can automatically change the DBS Receiver channels using the controller when the VCR has been programmed using Express Timer Programming (☞ pg. 40).*
  Because satellite programming does not use PlusCode; the Controller can not change the DBS Receiver channels during VCR Plus+ Timer Recording.
- *If a cable box is also used it is recommended that you connect the DBS receiver to your VCR's A/V inputs and the cable box to your VCR's antenna input.*

Situate And Connect Controller

1 SITUATE CONTROLLER

Place the Controller so that the path between its transmitter and the DBS receiver's remote sensor is unobstructed.

2 ATTACH CONTROLLER

Fasten securely using the supplied adhesive strips.

3 CONNECT DBS RECEIVER TO VCR

The connection method depends on the type of DBS receiver you have.

If your DBS receiver has AUDIO and VIDEO OUT connectors . . .

. . . connect them to the AUDIO and VIDEO IN connectors on your VCR. Set the VCR to channel "L-1" for the rear AUDIO and VIDEO IN connectors, or channel "F-1" for the front AUDIO and VIDEO IN connectors to use the DBS receiver.

If your DBS receiver doesn't have AUDIO and VIDEO OUT connectors . . .

. . . connect the antenna output connector on the DBS receiver to the ANT. IN connector on the rear of your VCR.

Set the VCR's tuner to the same channel as the DBS receiver's RF output. (See page 20 also.)

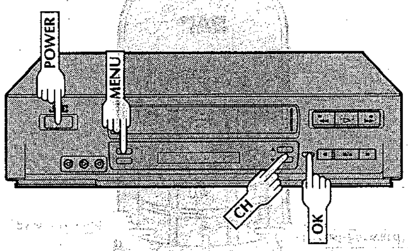
NOTE:

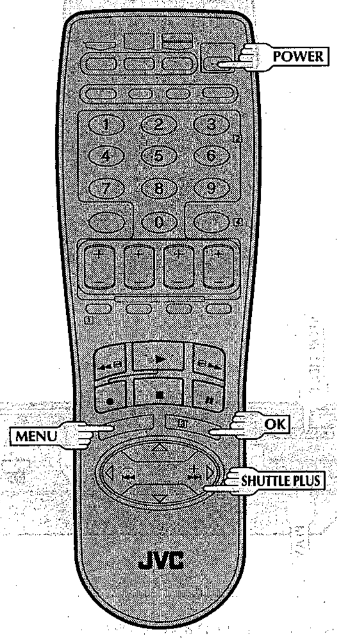
When connecting your DBS receiver refer to its instruction manual.

4 CONNECT CONTROLLER TO VCR

Connect to the CABLE BOX connector on your VCR.

Turn on the TV and select the VCR channel 3 or 4 (or AV mode).





Set DBS Receiver Output Channel & DBS Receiver Brand

1 TURN ON DBS RECEIVER

Select a channel other than channel 55, 100 or 205 on your DBS receiver.

2 TURN ON THE VCR

Press **POWER**.

- Set the VCR to the channel (3 or 4 or F-1 or L-1) on which the signals from the DBS receiver are received.

3 ACCESS MAIN MENU SCREEN

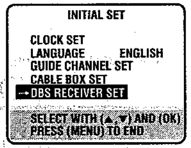
Press **MENU**.

4 ACCESS INITIAL SET SCREEN

Press **CH▲▼** or **SHUTTLE PLUS**△▽ to move the highlight bar (arrow) to "INITIAL SET", then press **OK** or **SHUTTLE PLUS** ▷.

5 ACCESS DBS RECEIVER SET SCREEN

Press **CH▲▼** or **SHUTTLE PLUS**△▽ to move the highlight bar (arrow) to "DBS RECEIVER SET", then press **OK** or **SHUTTLE PLUS** ▷.

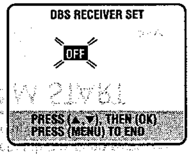

INITIAL SET

CLOCK SET
LANGUAGE ENGLISH
GUIDE CHANNEL SET
CABLE BOX SET
→DBS RECEIVER SET

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

6 SELECT DBS RECEIVER OUTPUT CHANNEL

Your selection depends on how your DBS receiver is connected to your VCR.


DBS RECEIVER SET

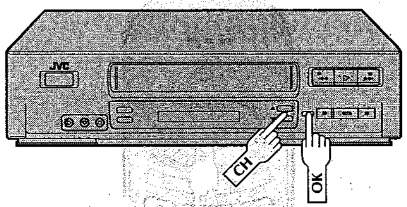
OFF

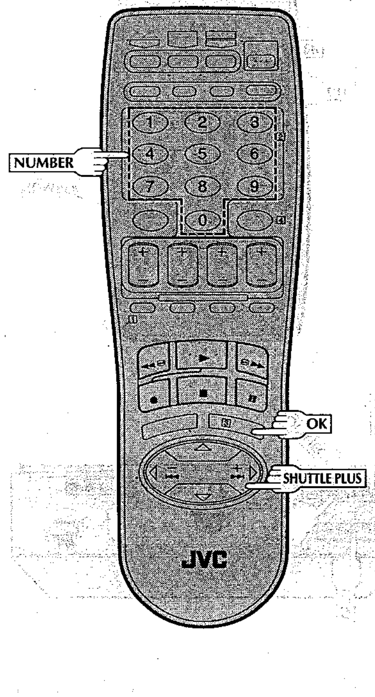
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

If your DBS receiver is connected to your VCR using an RF connection . . .
. . . press **CH ▲▼** or **SHUTTLE PLUS** △▽ until the channel number representing the DBS receiver's output (CH3 – CH4) appears on the screen.

If your DBS receiver is connected to your VCR's FRONT AUDIO/VIDEO IN connectors . . .
. . . press **CH ▲▼** or **SHUTTLE PLUS** △▽ until "ON F-1 (FRONT)" appears on the screen.

If your DBS receiver is connected to your VCR's REAR AUDIO/VIDEO IN connectors . . .
. . . press **CH ▲▼** or **SHUTTLE PLUS** △▽ until "ON L-1 (REAR)" appears on the screen.



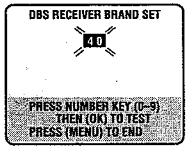


7 ACCESS DBS RECEIVER BRAND SET SCREEN

Press **OK**.

8 SET DBS RECEIVER BRAND

Press the appropriate **NUMBER** keys to enter the DBS Receiver Code from the following list, then press **OK**.


DBS RECEIVER BRAND SET

40

PRESS NUMBER KEY (0–9)
THEN (OK) TO TEST
PRESS (MENU) TO END

BRAND	CODE
JVC (DISH Network)	51
ECHOSTAR (DISH Network)	51
PRIMESTAR	50
SONY (DSS)	41
RCA (DSS)	40

- After **OK** is pressed, the program currently received through the DBS receiver will appear for about 10 seconds.
- If the DBS receiver's channel changes as follows, setting is complete. Press **OK** and "DBS RECEIVER CONTROL IS ON" appears on the screen for about 5 seconds, then it returns to the normal screen.

JVC → 100
ECHOSTAR → 100
PRIMESTAR → 55
SONY → 205
RCA → 205

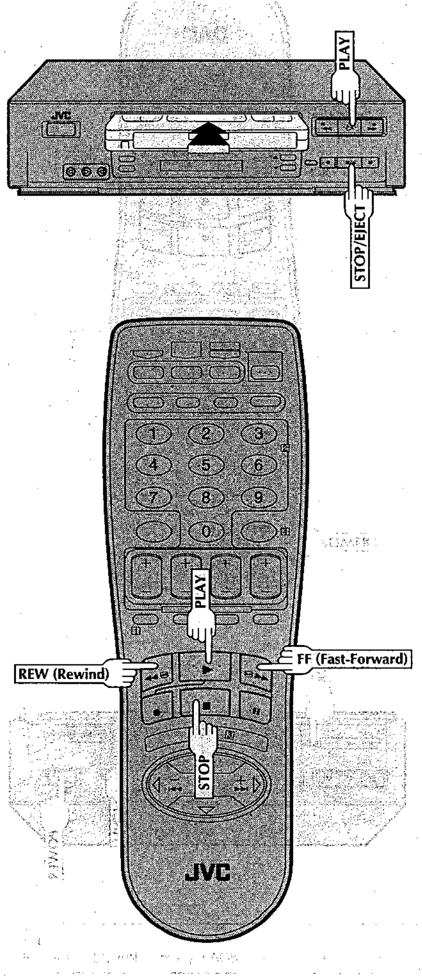
- If the DBS receiver's channel does not change as shown above, press **CH ▲▼** or **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "NO", then press **OK**. Re-enter the correct code.

NOTES:

- *It is possible that the Controller will not work with all types of DBS receiver.*
- *If your DBS receiver doesn't respond to the code, you can't use the Controller to change satellite channels. In this case, make sure to leave the DBS receiver turned on and tuned to the proper channel before the scheduled start of timer recording.*
- *The VCR can only change the satellite channel through the Controller during timer recording.*
- *If your DBS receiver is one that can't be operated with a remote control (because it has no remote sensor), you can't use the Controller to change its channels. Make sure to leave the DBS receiver turned on and tuned to the proper channel before the scheduled start of timer recording.*
- ***For customers in U.S.A.:** If you are unable to set the Controller, please contact JVC toll free at 1-800-252-5722.*

Simple Playback

Turn on the TV and select the VCR channel 3 or 4 (or AV mode).



1 LOAD A CASSETTE

Make sure the window side is up, the rear label side is facing you and the arrow on the front of the cassette is pointing towards the VCR. Don't apply too much pressure when inserting.

- The VCR's power comes on automatically.
- The counter is automatically reset to "0:00:00".
- If the cassette's record safety tab has been removed, playback begins automatically.

2 FIND PROGRAM START POINT

If the tape is advanced past the start point, press **REW**. To go forward, press **FF**.

3 START PLAYBACK

Press **PLAY**. "AUTO PICTURE" appears on the screen (when AUTO PICTURE is set to "ON" ☞ pg. 32).

4 STOP PLAYBACK

Press **STOP** or **STOP/EJECT**. Then press **STOP/EJECT** to remove the cassette.

INFORMATION

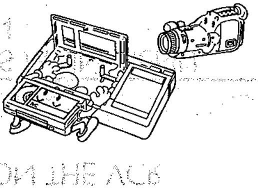
This video recorder is equipped with SQPB (S-VHS QUASI PLAYBACK) that lets you watch tapes recorded in the S-VHS format with regular VHS resolution.

- SQPB does not deliver Super VHS resolution.
- S-VHS recording is not possible with this video recorder.

Usable cassettes

Full-Size VHS
T-30 (ST-30**)
T-60 (ST-60**)
T-90
T-120 (ST-120**)
T-160 (ST-160**)
ST-210**

Compact VHS*
TC-20 (ST-C20**)
TC-30 (ST-C30**)
TC-40 (ST-C40**)

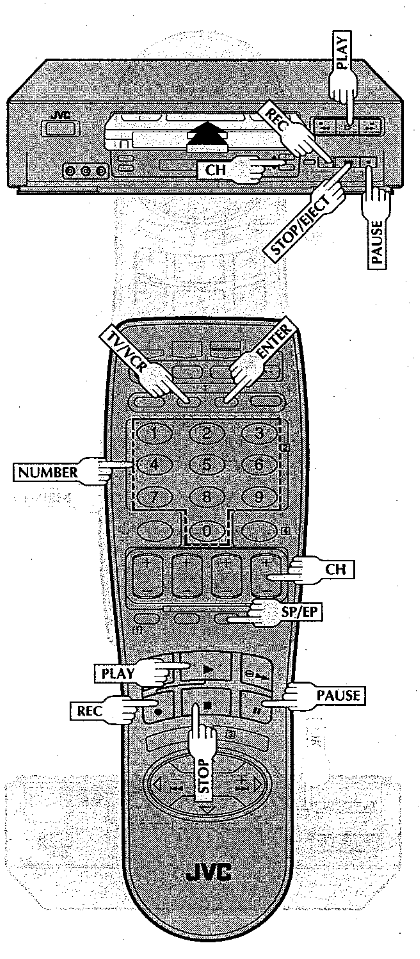


* Compact VHS camcorder recordings can be played on this video recorder. Simply place the recorded cassette into a VHS Cassette Adapter and it can be used just like any full-sized VHS cassette.

** This video recorder can record on regular VHS and Super VHS cassettes. However, it will record regular VHS signals only.

Simple Recording

Turn on the TV and select the VCR channel 3 or 4 (or AV mode).



1 LOAD A CASSETTE

Make sure the record safety tab is intact. If not, cover the hole with adhesive tape before inserting the cassette.

2 SELECT RECORDING CHANNEL

Press **CH▲▼** (+/–). Or press the appropriate **NUMBER** keys, then press **ENTER**. (The channel changes after a few seconds whether you press **ENTER** or not.)

- If you use the RF connection, by pressing the **TV/VCR** button, select VCR mode to view the program to be recorded.

3 SET TAPE SPEED

Press **SP/EP** to set the recording speed.

4 START RECORDING

Press and hold **REC** and press **PLAY** on the remote control, or press **REC** on the VCR's front panel.

5 PAUSE/RESUME RECORDING

Press **PAUSE**. Press **PLAY** to resume recording.

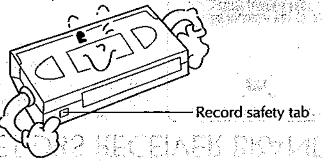
- During record pause, you can change the recording channel by using the **CH▲▼** (+/–) buttons or **NUMBER** keys.

6 STOP RECORDING

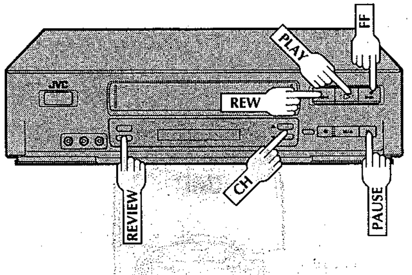
Press **STOP** or **STOP/EJECT**. Then press **STOP/EJECT** to remove the cassette.

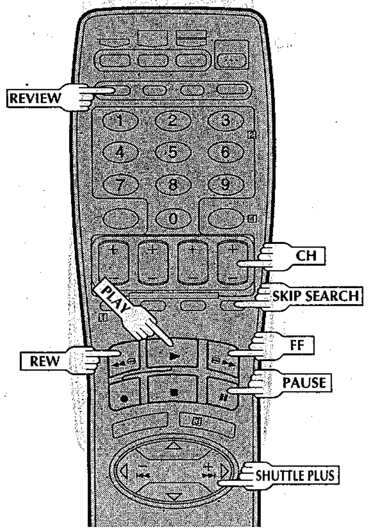
Accidental erasure prevention

- To prevent accidental recording on a recorded cassette, remove its record safety tab.
  To record on it later, cover the hole with adhesive tape.

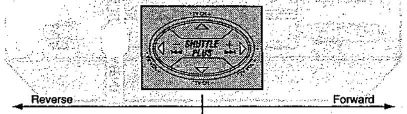


Playback Features





NOTE: Refer to the following for the operations described on this page.



Reverse search 3 steps	Reverse play	Reverse slow motion 5 steps	Slow motion 5 steps	Play	Forward search 4 steps

Still Picture/Frame-By-Frame Playback

1 PAUSE DURING PLAYBACK

Press **PAUSE**. If there is vertical jitter, use the **CH ▲** (+) or **▼** (–) button to correct the picture.

2 ACTIVATE FRAME-BY-FRAME PLAYBACK

Press **PAUSE** repeatedly to advance one frame at a time.

OR

Press **SHUTTLE PLUS ►►|** repeatedly for forward frame-by-frame playback or **SHUTTLE PLUS |◄◄** repeatedly for reverse frame-by-frame playback.

To resume normal playback, press **PLAY**.

Slow Motion/Reverse Slow Motion

1 ACTIVATE SLOW-MOTION PLAYBACK

For hands-free slow-motion, press and release **SHUTTLE PLUS |◄◄** during playback to decrease speed in the forward direction. Continue to press and release **SHUTTLE PLUS |◄◄** to select the reverse slow motion, reverse play and reverse search modes.

OR

During still picture, press and hold **SHUTTLE PLUS ►►|** for forward slow motion, or press and hold **SHUTTLE PLUS |◄◄** for reverse slow motion. Release to return to still picture.

OR

For forward slow motion during still picture, press and hold **PAUSE** for more than 2 seconds. Press **PAUSE** again to return to still picture.

To resume normal playback, press **PLAY**.

Variable-Speed Search/ Reverse Motion Playback

1 ACTIVATE VARIABLE-SPEED SEARCH

During playback, repeatedly press and release **SHUTTLE PLUS |◄◄** or **►►|** to select the search speed.

- To increase the speed in the forward direction, press and release **►►|** repeatedly to select the various forward search modes.
- To decrease the speed in the forward direction, press and release **|◄◄**.
- To play in reverse slow motion, and in reverse play mode, continue to press **|◄◄** repeatedly after selecting all the forward slow motion modes.

To resume normal playback, press **PLAY**.

High-Speed Search

1 ACTIVATE HIGH-SPEED SEARCH

During playback or still, press **FF** for forward high-speed search, or **REW** for reverse high-speed search.

To resume normal playback, press **PLAY**.

NOTE:

*For short searches, during playback or still, press and hold **FF** or **REW** for over 2 seconds. When released, normal playback resumes.*

Skip Search

1 SKIP OVER UNWANTED SECTIONS

Press **SKIP SEARCH** 1 to 4 times during playback. Each press initiates a 30-second period of fast-motion playback. Normal playback resumes automatically.

NOTES:

- *To return to normal playback during a Skip Search, press **PLAY**.*
- *If the Skip Menu screen appears, see page 30.*

Index Search

Index codes are placed on the tape at the start of each recording. You can find and automatically play back from the start of any recording using the Index Search function.

1 START SEARCH

While the tape is stopped, press **SHUTTLE PLUS |◄◄** or **►►|** (◁or▷).

2 ACCESS DISTANT CODE

To access a recording 2–9 index codes away, press **SHUTTLE PLUS |◄◄** or **►►|** (◁or▷) repeatedly until the correct number is displayed on screen (only if SUPERIMPOSE is set to ON (☞ pg. 28). Playback begins automatically when the desired recording is located.

- If necessary press **REW** or **FF** when play starts to search visually to find the very beginning of the desired program.

NOTE:

An index code is not placed on the tape when recording is paused and then resumed.

Instant ReView

At the press of a button, you can power up your VCR, rewind the tape and begin viewing the most recent timer-recorded program.

1 ACTIVATE INSTANT REVIEW

After ensuring that the Timer mode is disengaged, press **REVIEW**.

- The power comes on and the VCR rewinds to the index code indicating the start of the last timer-recorded program, then begins playback automatically.
- You can access a program 2–9 index codes away from the current position on the tape. If, for example, you have 5 programs recorded and you want to watch the third one, press **REVIEW** three times.
- If necessary press **REW** or **FF** when play starts to search visually to find the very beginning of the desired program.
- If the tape is already rewound when **REVIEW** is pressed, it will play the tape from the beginning. It will not fast forward to an index code.
- The Instant Review function will also operate if the VCR's power is on.

Manual Tracking

Once playback begins, the VCR's automatic tracking function is engaged. If tracking noise appears in the picture, you can override this and make the adjustment manually.

1 ENGAGE MANUAL TRACKING MODE

During playback, press the **CH▲** and **▼** buttons on the VCR's front panel simultaneously to cancel the automatic tracking mode and enable manual tracking adjust.

2 ADJUST MANUAL TRACKING

Press **CH ▲** (+) or **▼** (–) on the VCR's front panel or remote. Press briefly for fine adjust, or press and hold for coarse adjust. Watch the screen and continue adjusting until optimum picture and sound quality are achieved.

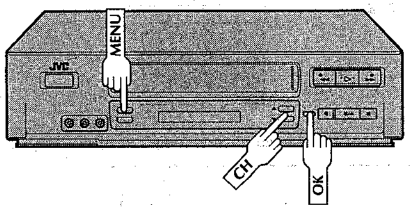
3 RE-ENGAGE AUTOMATIC TRACKING

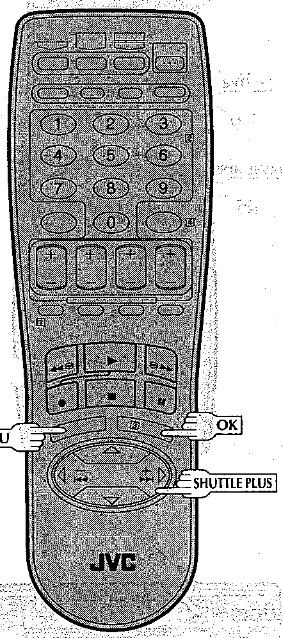
Press the **CH▲** and **▼** buttons on the VCR's front panel simultaneously.

- When automatic tracking is re-engaged, Auto Picture is automatically activated.

NOTES:

- *To obtain a noiseless still picture it may be necessary to adjust tracking in slow playback and then engage Pause.*
- *Manual tracking is possible during hands-free slow-motion. During hands-free slow-motion playback, simply press **CH ▲** (+) or **▼** (–) on the VCR's front panel or remote to adjust tracking.*





Video Stabilizer

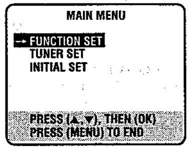
By activating the Video Stabilizer you can correct vertical vibrations in the picture when playing back unstable EP recordings that were made on another VCR. When this function is set to "ON", vertical vibration will be automatically corrected.
*The default setting is "OFF".

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS FUNCTION SET SCREEN

Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.



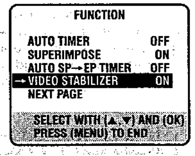
MAIN MENU

→ FUNCTION SET
TUNER SET
INITIAL SET

PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

3 ACTIVATE VIDEO STABILIZER

Move the highlight bar (arrow) to "VIDEO STABILIZER" by pressing **CH ▲▼** or **SHUTTLE PLUS** △▽, then press **OK** or **SHUTTLE PLUS** ▷ to set to "ON".



FUNCTION

AUTO TIMER OFF
SUPERIMPOSE ON
AUTO SP→EP TIMER OFF
→ VIDEO STABILIZER ON
NEXT PAGE

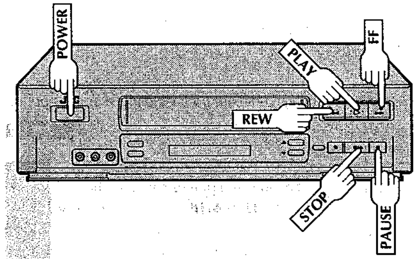
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

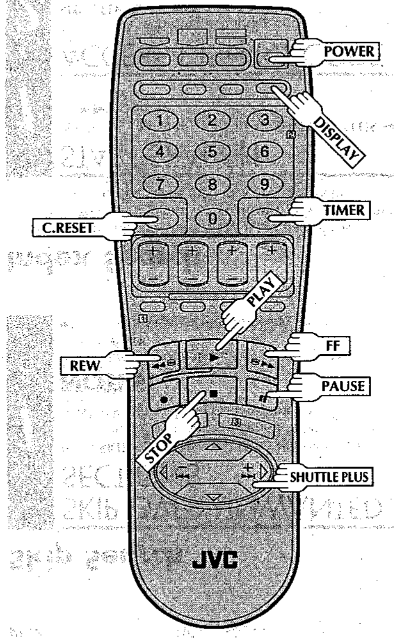
4 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTES:

- *Regardless of the setting, this function has no effect with SP recordings, during recording and during special-effects playback.*
- *When you finish viewing the tape, be sure to set it back to "OFF".*

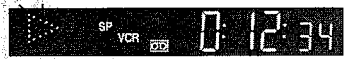




Repeat Playback

1 START REPEAT

Press and hold **PLAY** (until " ▷ " blinks on the front display panel) during playback, then release.



- The entire tape is played back 50 times.

2 STOP REPEAT

To stop, press **STOP** at any time.

NOTE:

*Pressing **PLAY, REW, FF, PAUSE** or **SHUTTLE PLUS** ⏮ or ⏭ also stops Repeat Playback.*

Counter Reset

1 RESET COUNTER TO ZERO

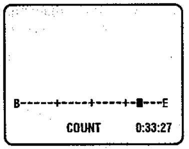
Press **C.RESET**.

NOTE:

*By pressing the **DISPLAY** button, you can change the display to show the counter reading, channel number or clock time. (Channel number is not displayed during playback.)*

Tape Position Indicator

The Tape position indicator appears on screen when, from the stop mode, you press **FF** or **REW**, or perform an Index Search or Instant ReView. The position of "■" in relation to "B" (Beginning) or "E" (End) shows you where you are on the tape.



B----+----+----+-■---E
COUNT 0:33:27

NOTES:

- *"SUPERIMPOSE" must be set to "ON", or the indicator will not appear (☞ pg. 28).*
- *It may take a few seconds for the Tape Position Indicator to be displayed.*

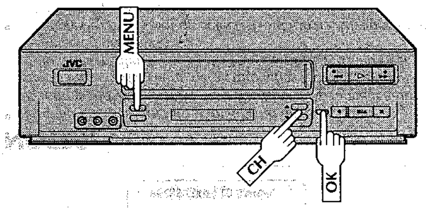
Next-Function Memory

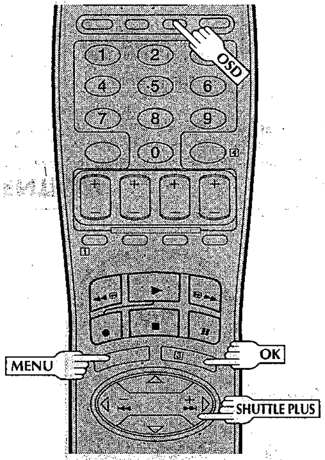
The Next Function Memory "tells" the VCR what to do after rewinding. Before continuing, ensure that the VCR is in stop mode.

a– For Automatic Start Of Playback After Tape Rewind . . .
. . . press **REW**, then press **PLAY** within 2 seconds.
b– For Automatic Power Off After Tape Rewind . . .
. . . press **REW**, then press **POWER** within 2 seconds.
c– For Automatic Timer Standby After Tape Rewind . . .
. . . press **REW**, then press **TIMER** within 2 seconds.

NOTE:

It is not possible to select the Automatic Timer functions if the cassette's record safety tab is removed.





Superimpose

This function, switchable between ON and OFF, determines whether or not operational indicators will appear on screen.

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS FUNCTION SET SCREEN

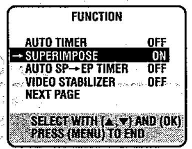
Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.

3 SELECT SUPERIMPOSE SET MODE

Move the highlight bar (arrow) to "SUPERIMPOSE" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷ to select the desired mode:

a– Select "ON" if you want the superimposed operational indications on the TV screen.

b– Select "OFF" if you do not want the superimposed operational indications on the screen.



FUNCTION

AUTO TIMER OFF
→ SUPERIMPOSE ON
AUTO SP→EP TIMER OFF
VIDEO STABILIZER OFF
NEXT PAGE

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

4 RETURN TO NORMAL SCREEN

Press **MENU**.

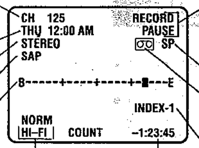
To recall an indication

1 Press **OSD**.
- ■ All indications corresponding to the current status are displayed for 5 seconds. After that, the counter information and RECORD/PAUSE if in the Record Pause mode, are left displayed on the screen.

2 Press **OSD** again to clear the display.

NOTES:
- *If you engage the Record Pause mode, RECORD/PAUSE is displayed regardless of the Superimpose mode setting.*
- *If you select a channel on which no signal is received, the channel number is displayed regardless of the Superimpose mode setting.*

The superimposed indication on the TV screen tells you what the VCR is doing.



Tuned-in channel or AUX(iliary) mode
When the channel is changed, the new channel is displayed on the screen for 5 seconds.

Clock time

Stereo program indication

Second Audio Program indication

Tape position indicator

Audio mode indications

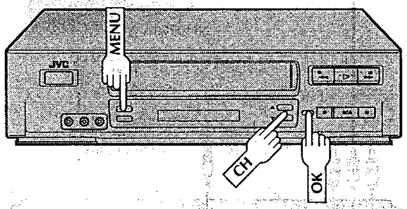
Counter reading

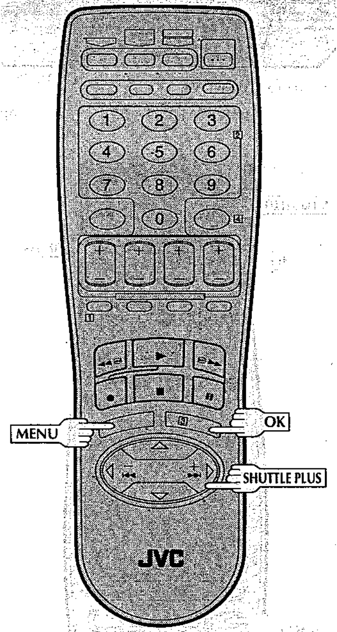
Operation mode
When the operation mode is changed, the new mode is displayed — RECORD (5 sec.), PLAY (5 sec.), FF/REW (5 sec. when engaged from Stop mode), RECORD PAUSE (for as long as Pause is engaged), and ITR *:** (5 sec.).

Tape speed indication

"Cassette Loaded" mark
When a cassette is loaded, the mark is displayed for 5 seconds. It blinks when the VCR's EJECT button is pushed.

INDEX indication





Select The Soundtrack

Your VCR can record two soundtracks simultaneously (Normal and Hi-Fi) and play back the selected one, or both together. Or, when viewing a pre-recorded tape that contains two separate Hi-Fi audio programs, you can choose to listen to either one by selecting either "Hi-Fi L" or "Hi-Fi R" in step **3**.

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

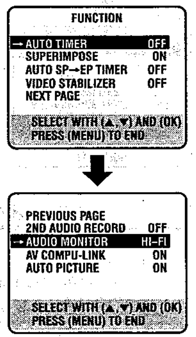
2 ACCESS FUNCTION SET SCREEN

Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.

3 SELECT AUDIO MONITOR SET MODE

Move the highlight bar (arrow) to "AUDIO MONITOR" by pressing **CH ▲▼** or **SHUTTLE PLUS** △▽, then press **OK** or **SHUTTLE PLUS** ▷ to select the desired mode:

a– Hi-Fi
b– Hi-Fi L
c– Hi-Fi R
d– Normal
e– Mix



FUNCTION

→ AUTO TIMER OFF
SUPERIMPOSE ON
AUTO SP→EP TIMER OFF
VIDEO STABILIZER OFF
NEXT PAGE

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

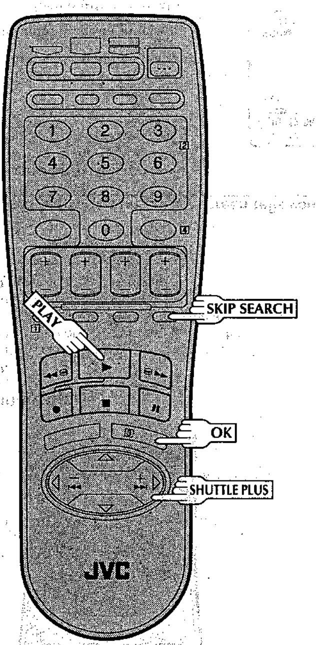
PREVIOUS PAGE
2ND AUDIO RECORD OFF
→ AUDIO MONITOR HI-FI
AV COMPU-LINK ON
AUTO PICTURE ON

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

4 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTES:
- *If the tape being played back has no Hi-Fi soundtrack, the Normal soundtrack will be heard no matter what choice you make in step* **3**.
- *If RF connection is used for TV, even if Hi-Fi audio monitor is selected the sound will be mono and will be reproduced in both loudspeakers.*



Movie Advance

This feature helps you locate certain parts of prerecorded movies (rented or purchased) and works in two ways.

- You can go to the beginning of the movie, skipping over all previews.
- You can fast-motion the tape to the beginning of the next preview, so you can skip over previews one by one.

1 LOAD A CASSETTE

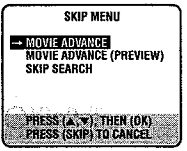
Insert a cassette that has a prerecorded movie (rented or purchased), with no safety tab, into the VCR. Playback begins automatically.

2 ACCESS SKIP MENU SCREEN

Press **SKIP SEARCH**.

3 SELECT MODE

Press **CH▲▼** or **SHUTTLE PLUS**△▽ to move the highlight bar (arrow) to your choice.



SKIP MENU
→ MOVIE ADVANCE
MOVIE ADVANCE (PREVIEW)
SKIP SEARCH
PRESS (▲,▼), THEN (OK)
PRESS (SKIP) TO CANCEL

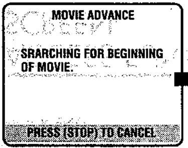
a– Select "MOVIE ADVANCE" if you want to advance directly to the beginning of the movie.

b– Select "MOVIE ADVANCE (PREVIEW)" if you want to advance to the next preview.

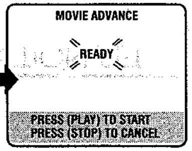
c– Select "SKIP SEARCH" if you do not want to perform Movie Advance, then press **OK** to go back to the normal screen. Pressing **SKIP SEARCH** activates the Skip Search function (☞ pg. 25).

4 PERFORM MOVIE ADVANCE

a– If you selected "MOVIE ADVANCE" in step 3 and press **OK**, the following screen will appear with a blue background. The VCR will rewind the beginning of the tape, then will fast-motion to the beginning of the movie. "READY" will appear and blink when the beginning of the movie is detected and the Stop mode will be engaged. Press **PLAY** to view the movie.



MOVIE ADVANCE
SEARCHING FOR BEGINNING OF MOVIE.
PRESS (STOP) TO CANCEL

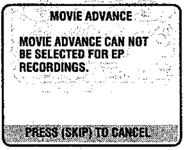


MOVIE ADVANCE
READY
PRESS (PLAY) TO START
PRESS (STOP) TO CANCEL

b– If you selected "MOVIE ADVANCE (PREVIEW)" in step 3 and press **OK**, the VCR will fast-motion to the beginning of the next preview and normal playback will resume when it is detected.
Each press of **SKIP SEARCH** fast-motions to the beginning of the next preview, thereby skipping over one preview each time.

ATTENTION

Movie Advance works only on prerecorded cassettes that have been recorded in the SP mode, and have no safety tab. If the VCR detects the EP mode after you press **OK** in step **4**, the following screen appears.

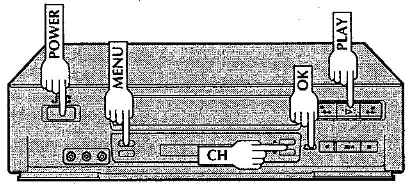


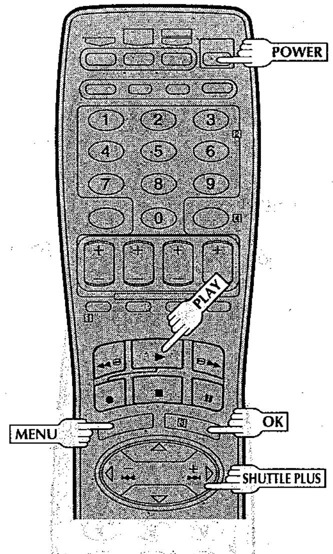
MOVIE ADVANCE
MOVIE ADVANCE CAN NOT BE SELECTED FOR EP RECORDINGS.
PRESS (SKIP) TO CANCEL

NOTES:

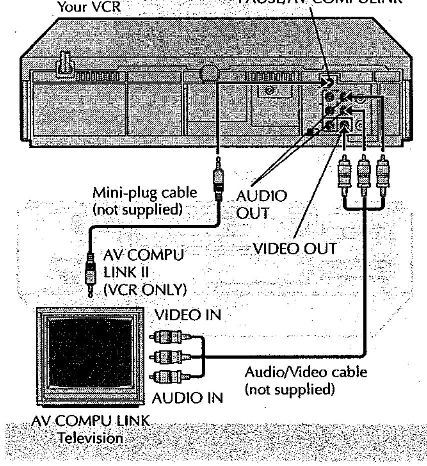
- *Normally there is a period of black and no audio at the beginning and end of previews. The Movie Advance feature detects those parts where the picture fades to black and the audio fades to silence, and initiates fast-motion to skip over the detected previews.*
- *Some previews may not be detected and Movie Advance may not work properly.*
- *The setting you selected in step* **3** *remains in effect until the cassette is ejected.*

Patents Pending





Example



AV COMPU LINK Playback

Your VCR is compatible with JVC's AV COMPU LINK components, including amplifiers (or receivers) and televisions. AV COMPU LINK provides one touch control of the audio and video components that are linked via their AV COMPU LINK connectors.

For example: simply load a cassette in the VCR and press **PLAY** and the AV COMPU LINK components automatically power on, the TV's AV mode is selected and the VCR goes into play mode. (PLAY need not be pressed if the cassette's record safety tab is removed.)

1 MAKE CONNECTION

Connect your VCR to an AV COMPU LINK component as shown in the illustration in the left column.

- The mini-plug cable is a mono 3.5 mm mini-plug to mono 3.5 mm mini-plug connector.

2 ACCESS MAIN MENU SCREEN

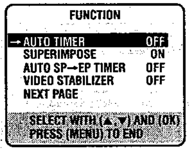
Press **MENU**.

3 ACCESS FUNCTION SET SCREEN

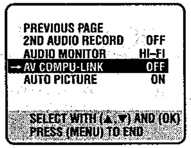
Press **CH▲▼** or **SHUTTLE PLUS**△▽ to move the highlight bar (arrow) to "FUNCTION SET", then press **OK** or **SHUTTLE PLUS** ▷.

4 ENABLE AV COMPU LINK PLAYBACK

Press **CH▲▼** or **SHUTTLE PLUS**△▽ to move the highlight bar (arrow) to "AV COMPU-LINK", then press **OK** or **SHUTTLE PLUS** ▷ to set to "ON".



FUNCTION
→ AUTO TIMER OFF
SUPERIMPOSE ON
AUTO SP→EP TIMER OFF
VIDEO STABILIZER OFF
NEXT PAGE
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END



PREVIOUS PAGE
2ND AUDIO RECORD OFF
AUDIO MONITOR HI-FI
→ AV COMPU-LINK OFF
AUTO PICTURE ON
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

5 RETURN TO NORMAL SCREEN

Press **MENU**.

6 PERFORM AV COMPU LINK PLAYBACK

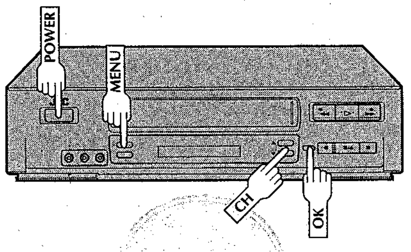
Simply insert a cassette and press **PLAY** (if the cassette's record safety tab has been removed, playback begins automatically). Linked components are turned on, and the TV set to its AV mode, automatically!

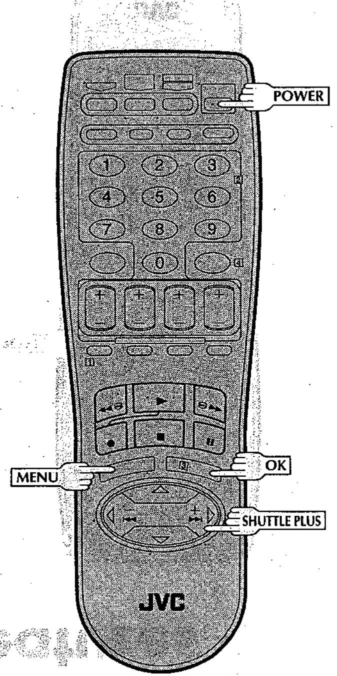
NOTE:

Connection varies depending on the type of JVC TV you have. Please refer to the TV's instruction manual when making this connection.

Auto Picture

Turn on the TV and select the VCR channel 3 or 4 (or AV mode).





Auto Picture compensates for variations in tape characteristics to ensure the best possible playback picture. It checks and compensates for the condition of the tape at the beginning of automatic tracking when playback is selected. The default setting is "ON".

Preparation

1 TURN ON THE VCR

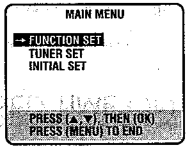
Press **POWER**.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

3 ACCESS FUNCTION SET SCREEN

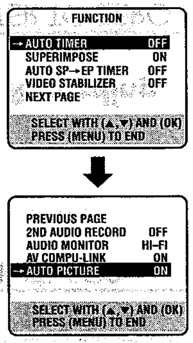
Press **CH▲▼** or **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "FUNCTION SET", then press **OK** or **SHUTTLE PLUS** ▷.



MAIN MENU
→ FUNCTION SET
TUNER SET
INITIAL SET
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

4 SELECT AUTO PICTURE

Press **CH ▲▼** or **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "AUTO PICTURE", then press **OK** or **SHUTTLE PLUS** ▷ to set to "ON" or "OFF".



FUNCTION
→ AUTO TIMER OFF
SUPERIMPOSE ON
AUTO SP→EP TIMER OFF
VIDEO STABILIZER OFF
NEXT PAGE
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

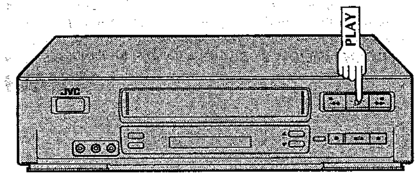
PREVIOUS PAGE
2ND AUDIO RECORD OFF
AUDIO MONITOR HI-FI
AV COMPU-LINK ON
→ AUTO PICTURE ON
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

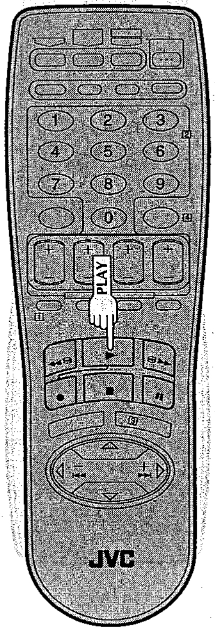
NOTE:

When using rental tapes, or tapes recorded on other VCRs, select "ON" or "OFF" as desired to give the best picture.

5 RETURN TO NORMAL SCREEN

Press **MENU**.





Playback

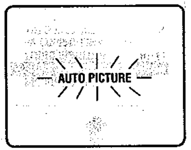
The VCR assesses the quality of the tape once you start playback.

Perform steps **1** and **2** on page 22 ("Simple Playback") before continuing.

1 START PLAYBACK

Press **PLAY**.

- The VCR adjusts the playback picture quality based on the quality of the tape in use.

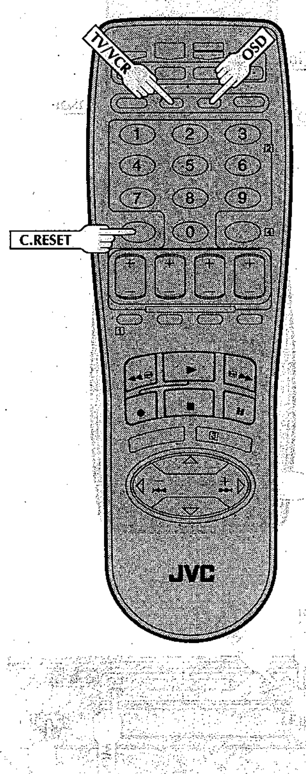


— AUTO PICTURE —

NOTES:

- *When using rental tapes, or tapes recorded on other VCRs, set "AUTO PICTURE" in step **4** of the Preparation procedure to either "ON" or "OFF" as desired to give the best picture (☞ pg. 32).*
- *The Auto Picture screen only appears at the beginning of automatic tracking. Even though the screen doesn't appear after that, the Auto Picture function is operative.*
- *To display the Auto Picture screen, "SUPERIMPOSE" must be set to "ON" or the Auto Picture screen will not appear (☞ pg. 28).*

Recording Features



Record One Program While Watching Another

1 ENGAGE TV MODE

During recording...
- Press **TV/VCR**. The VCR's VCR indicator goes out. (If you are using the RF connection (☞ pg. 6) to view the output from your VCR, the TV broadcast being recorded disappears.)
- If you are using the AV connection (☞ pg. 6) to view the output from your VCR, change the TV's input mode from AV to TV.

2 SELECT CHANNEL FOR VIEWING

Use the TV's channel selector to set the channel you want to watch.

Display Elapsed Recording Time

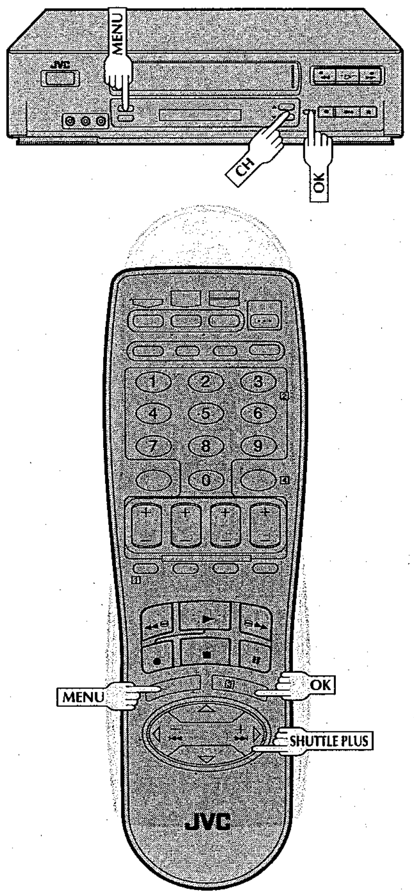
1 RESET COUNTER TO ZERO

Before recording starts, press **C.RESET**. The counter resets to zero and displays the exact elapsed time as the tape runs.

2 DISPLAY ELAPSED TIME ON SCREEN

During recording, press **OSD** at any time to see the elapsed time.
All indications corresponding to the current status of the VCR are displayed for 5 seconds. The counter display remains on the screen indicating the elapsed time.
Press **OSD** again to remove the display.

- Make sure "SUPERIMPOSE" is set to "ON" (☞ pg. 28).
- The indications are not recorded.



Stereo And SAP (Second Audio Program)

Your VCR's built-in MTS decoder enables reception of Multi-channel TV Sound broadcasts.
When the channel is changed...
- The "STEREO" indication appears on the screen for about 5 seconds if the program is a stereo broadcast.
- The "SAP" indication appears on the screen for about 5 seconds if the program is an SAP broadcast.
- Both indications appear when a stereo program is accompanied by SAP audio.

To Record Stereo Programs . . .
. . . simply follow the basic recording procedure.

To Listen To Stereo Soundtrack During Recording . . .
. . . set "AUDIO MONITOR" to "HI-FI" at the Function screen (☞ pg. 29).

To Record SAP Programs . . .

1 ACCESS MAIN MENU SCREEN

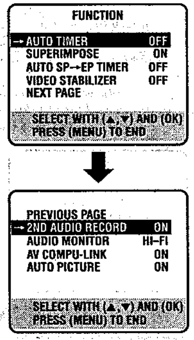
Press **MENU**.

2 ACCESS FUNCTION SET SCREEN

Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.

3 SELECT 2ND AUDIO RECORD SET MODE

Move the highlight bar (arrow) to "2ND AUDIO RECORD" by pressing **CH ▲▼** or **SHUTTLE PLUS** △▽, then press **OK** or **SHUTTLE PLUS** ▷ to set to "ON".



```
         FUNCTION

→AUTO TIMER              OFF
 SUPERIMPOSE              ON
 AUTO SP→EP TIMER        OFF
 VIDEO STABILIZER        OFF
 NEXT PAGE

 SELECT WITH (▲,▼) AND (OK)
 PRESS (MENU) TO END
```

```
 PREVIOUS PAGE
→2ND AUDIO RECORD         ON
 AUDIO MONITOR         HI-FI
 AV COMPU-LINK            ON
 AUTO PICTURE             ON

 SELECT WITH (▲,▼) AND (OK)
 PRESS (MENU) TO END
```

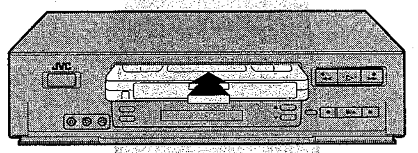
4 RETURN TO NORMAL SCREEN

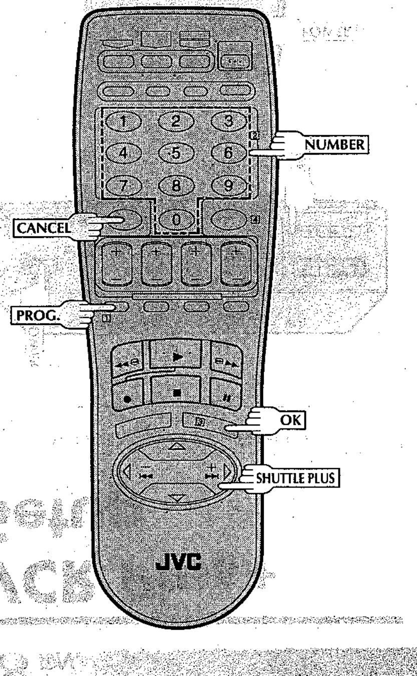
Press **MENU**.

NOTES:
- *If a SAP program is received and "2ND AUDIO RECORD" is set to "ON", the SAP audio is recorded on both the Normal and Hi-Fi tracks. The main audio program is not recorded.*
- *If a non-SAP program is received, the main audio is recorded on both the Hi-Fi and Normal audio tracks.*

VCR Plus+ Timer Programming

Turn on the TV and select the VCR channel 3 or 4 (or AV mode).





Timer recording allows you to program the VCR to automatically record a program that will be broadcast at some future time.
The timer record function can be programmed using VCR Plus+ or Express Timer Programming up to 8 shows as far as a year in advance. (☞ pg. 36 or 40)
The VCR Plus+ timer programming system eliminates the need to input channel, date, start and stop time data when setting the timer record function. Simply key in the PlusCode number for the TV program you wish to record and the VCR's timer will be automatically programmed. (The PlusCodes are the numbers next to the programs in most TV listings.)

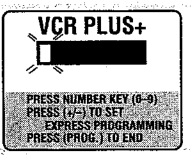
1 LOAD A CASSETTE

Make sure the record safety tab is present.

- The VCR's power comes on automatically.

2 ACCESS VCR PLUS+ SCREEN

Press **PROG.** on the remote control.

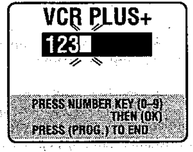

VCR PLUS+

PRESS NUMBER KEY (0–9)
PRESS (+/–) TO SET
EXPRESS PROGRAMMING
PRESS (PROG.) TO END

- The clock must be set in order to access the VCR Plus+ screen. If you haven't set the clock, the Main Menu screen appears after an error message is displayed.
Refer to page 8 for the Plug & Play procedure or page 11 for the clock setting procedure.

3 ENTER PLUSCODE NUMBER

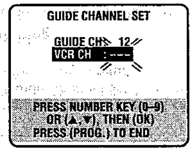
Press the appropriate **NUMBER** keys to enter the PlusCode number printed in the TV listings for the TV program you wish to record and press **OK**.
*If the Guide Channel Set screen appears, go to step **4**.*
*If the VCR Plus+ Program screen appears, go to step **5**.*


VCR PLUS+
123

PRESS NUMBER KEY (0–9)
THEN (OK)
PRESS (PROG.) TO END

- To make corrections, press **CANCEL** and input the correct PlusCode number.

4 INPUT RECEIVING CHANNEL NUMBER

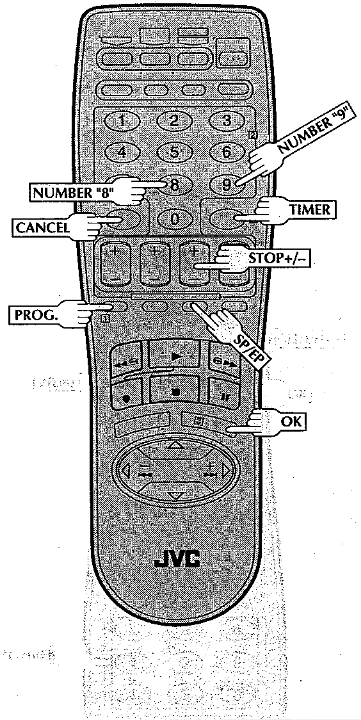

GUIDE CHANNEL SET

GUIDE CH 12
VCR CH : – – –

PRESS NUMBER KEY (0–9)
OR (▲,▼), THEN (OK)
PRESS (PROG.) TO END

The Guide Channel Number, which is assigned to the TV or cable station for the PlusCode number that you entered in step **3**, will appear automatically on the Guide Channel Set screen. Input the number of the channel on which the broadcast for the PlusCode number is received on the VCR or cable box using the **NUMBER** keys, **CH ▲▼** or **SHUTTLE PLUS △▽**, then press **OK**.

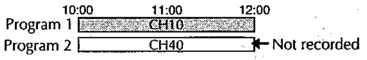
- The Guide Channel Set screen appears only when you input the PlusCode number of a station for which the Guide Channel number has not been set already.
- If you receive your channels with a cable box and if you have properly set your Controller, "CABLE CH" appears in place of "VCR CH". If not, refer to pages 16 – 18.



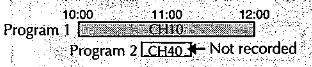
ATTENTION

If there is a conflict in the timer schedule and one program overlaps with another, only the parts shown below in gray will be recorded.

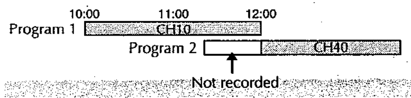
***Pattern 1:** The program with the lower program number will be recorded.*



***Pattern 2:** The program that is broadcast earlier will be recorded.*

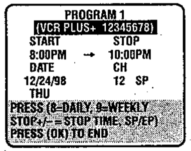


***Pattern 3:** The program that is broadcast earlier will be recorded, followed by the remaining portion of the other program.*



5 CHECK PROGRAM DATA

The PlusCode number you entered and the matching Timer-Recording information is displayed on the Program screen. Check to make sure it's accurate.


PROGRAM 1
(VCR PLUS+ 12345678)
START STOP
8:00PM → 10:00PM
DATE CH
12/24/98 12 SP
THU
PRESS (8=DAILY, 9=WEEKLY
STOP+/– = STOP TIME, SP/EP)
PRESS (OK) TO END

- To change the stop time, press **STOP +/–**.
- To timer-record daily or weekly serials, press **DAILY** (**NUMBER** "8") or **WEEKLY** (**NUMBER** "9"). "DAILY" or "WEEKLY" appears on the Program screen.
Pressing the button again makes each corresponding display disappear.
- If you made a mistake, press **CANCEL** to access the VCR Plus+ screen again and input the correct PlusCode number.
- If the PlusCode number you inputted is incorrect, "ERROR" may appear on the screen to advise you of the error. This happens when the PlusCode number is for a program which has already passed. "ERROR" is displayed for about 5 seconds and the VCR Plus+ screen reappears.

6 SET TAPE SPEED

Press **SP/EP**.

7 RETURN TO NORMAL SCREEN

Press **PROG.** or **OK**. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

8 ENGAGE TIMER MODE

Press **TIMER**. The VCR turns off automatically and "⏲" is displayed on the display panel.

IMPORTANT

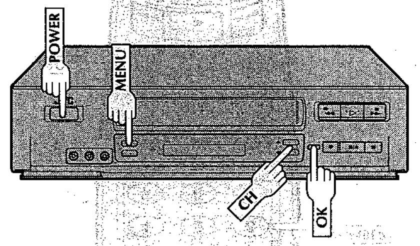
If you have moved to a different area or if a broadcasting station's channel number has been changed, the wrong VCR or CABLE CH number will be displayed on the VCR Plus+ Program screen in step **5**. When this happens, set the correct the Guide Channel number for that station. (☞ pg. 38, "VCR Plus+ Setup")

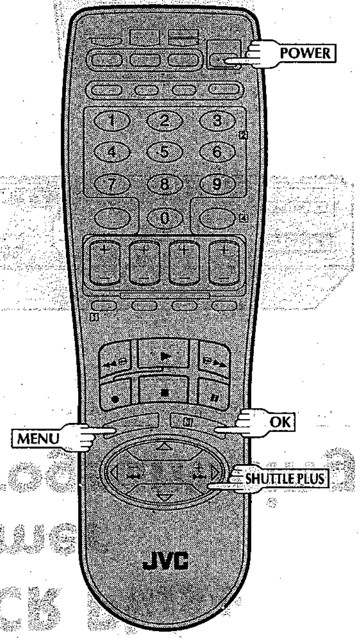
NOTES:

- *To disengage the timer before recording starts, press **TIMER** again. Pressing once more re-engages it.*
- *In case of a power failure after programming, the VCR's memory backup keeps your selections for approximately 10 minutes.*
- *When timer-recording cable channels received through a Cable Box, be sure to keep the Cable Box set to ON.*

VCR Plus+ Setup

Turn on the TV and select the VCR channel 3 or 4 (or AV mode).





IMPORTANT

If you have moved to a different area or if a broadcasting station's channel number has been changed, the wrong VCR or CABLE CH number will be displayed on the VCR Plus+ Program screen (☞ step 5 on page 37). When this happens, perform the following steps to set the correct the Guide Channel number for that station.

To ensure that VCR Plus+Timer Recording operates correctly it is necessary to set the VCR Plus+ "Guide Channel Set " for each station. Please read the following information carefully.

VCR Plus+ Guide Channel Matching

VCR Plus+ assigns a VCR Plus+ "Guide Channel" to broadcast and cable TV channels. These Guide Channel numbers are also called the VCR Plus+ Channel Codes. Most TV listings have a section, usually a chart, indicating the "Guide Channel" numbers assigned to each station. For accurate VCR Plus+ Programming the VCR Plus+ Guide Channel number for each station should match the channel number on which it is received in your area.

NOTES:

- *In many instances the VCR Plus+ Guide Channel numbers for cable and broadcast TV stations* ***DO NOT*** *match the channel number on which it is received by your VCR or cable box. Check your TV listing, or contact your cable supplier for details.*
- *Many broadcast TV stations can be viewed on cable. Check your TV listing, or contact your cable supplier for details.*

1 TURN ON THE VCR

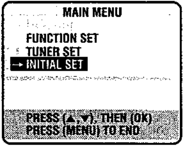
Press **POWER**.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

3 ACCESS INITIAL SET SCREEN

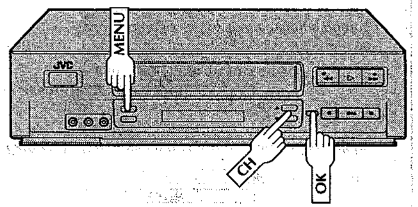
Press **CH▲▼** or **SHUTTLE PLUS**△▽ to move the highlight bar (arrow) to "INITIAL SET", then press **OK** or **SHUTTLE PLUS** ▷.

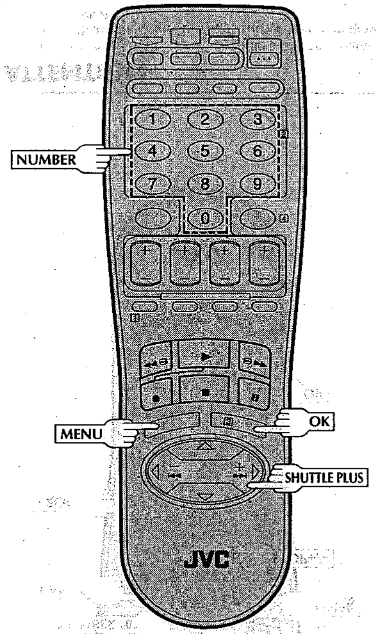


MAIN MENU

FUNCTION SET
TUNER SET
→ INITIAL SET

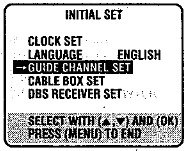
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END





4 ACCESS GUIDE CHANNEL SET SCREEN

Press **CH▲▼** or **SHUTTLE PLUS**△▽ to move the highlight bar (arrow) to "GUIDE CHANNEL SET", then press **OK** or **SHUTTLE PLUS** ▷.



INITIAL SET

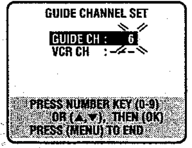
CLOCK SET
LANGUAGE ENGLISH
→ GUIDE CHANNEL SET
CABLE BOX SET
DBS RECEIVER SET

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

5 INPUT GUIDE CHANNEL NUMBER

Press **CH▲▼**, **SHUTTLE PLUS**△▽ or the appropriate **NUMBER** keys to input the VCR Plus+ Guide Channel number as shown in the TV listing. Then press **OK** or **SHUTTLE PLUS** ▷.

(Ex.) When inputting the Guide Channel number 6 for WNJU(Ind.)



GUIDE CHANNEL SET

GUIDE CH : 6
VCR CH : -- --

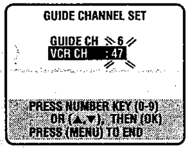
PRESS NUMBER KEY (0-9)
OR (▲,▼), THEN (OK)
PRESS (MENU) TO END

- If you receive your channels with a cable box and if you have properly set your Controller, "CABLE CH" appears in place of "VCR CH". If not, refer to pages 16 – 18 and re-perform the procedure.

6 INPUT RECEIVING CHANNEL NUMBER

Press **CH▲▼**, **SHUTTLE PLUS**△▽ or the appropriate **NUMBER** keys to input the number of the channel on which the Guide Channel's broadcasts are received. Then press **OK** or **SHUTTLE PLUS** ▷.

(Ex.) If WNJU(Ind.) is received on channel 47



GUIDE CHANNEL SET

GUIDE CH : 6
VCR CH : 47

PRESS NUMBER KEY (0-9)
OR (▲,▼), THEN (OK)
PRESS (MENU) TO END

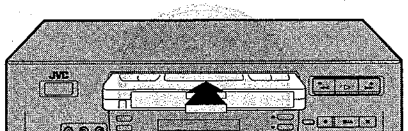
- Repeat steps **5** and **6** for each instance.

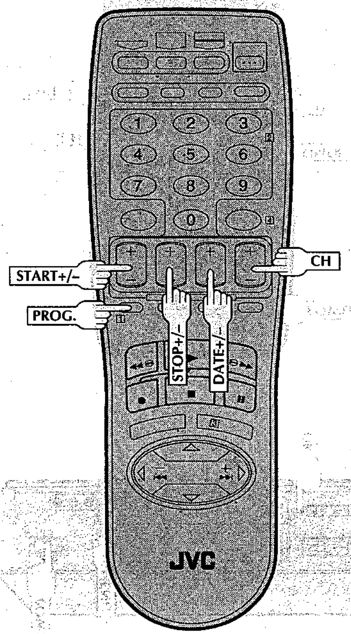
7 RETURN TO NORMAL SCREEN

Press **MENU**.

Express Timer Programming

Turn on the TV and select the VCR channel 3 or 4 (or AV mode).




START+/–
PROG.
CH
STOP+/–
DATE+/–
JVC

You can directly program the VCR's timer to record up to 8 shows, as far as a year in advance. Remember, the clock must be set before you can program the timer (☞ pg. 8 or 11).

1 LOAD A CASSETTE

Make sure the record safety tab is intact. If not, cover the hole with adhesive tape, then load it into the VCR.

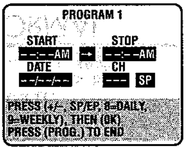
- The VCR comes on, and the counter is reset, automatically.

2 ACCESS VCR PLUS+ SCREEN

Press **PROG.**

3 ACCESS PROGRAM SCREEN

Press **START** +/–. (If you're just starting out, "PROGRAM 1" appears.)

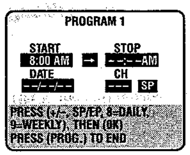

PROGRAM 1
START
STOP
--:--AM
→
--:--AM
DATE
CH
--/--/--

SP
PRESS (+/–, SP/EP, 8=DAILY, 9=WEEKLY), THEN (OK)
PRESS (PROG.) TO END

4 SET PROGRAM START TIME

Press **START** +/– to enter the time you want recording to start.

- Press and hold **START** +/– to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.


PROGRAM 1
START
STOP
8:00 AM
→
--:--AM
DATE
CH
--/--/--

SP
PRESS (+/–, SP/EP, 8=DAILY, 9=WEEKLY), THEN (OK)
PRESS (PROG.) TO END

5 SET PROGRAM STOP TIME

Press **STOP** +/– to enter the time you want recording to stop.

- Press and hold **STOP** +/– to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.

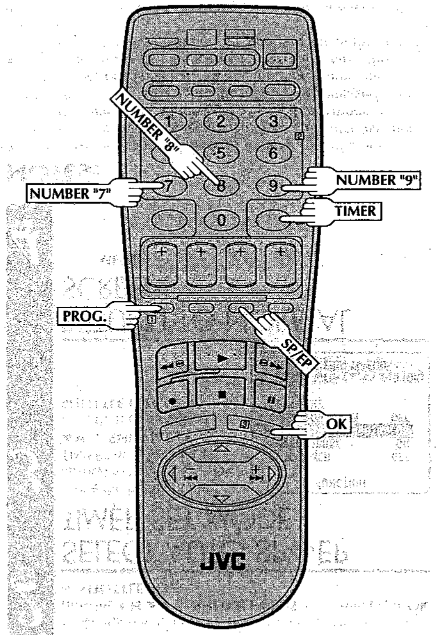
6 SET PROGRAM DATE

Press **DATE** +/–. (The current date is displayed on screen. The date you enter appears in its place.)

7 SET CHANNEL NUMBER

Press **CH** +/–.

- If you are using a DBS receiver, see "ATTENTION FOR DBS RECEIVER USERS" on next page.
- Holding down **CH** +/– rapidly scans through the channels.


NUMBER "8"
NUMBER "7"
NUMBER "9"
TIMER
PROG.
SP/EP
OK
JVC

8 SET TAPE SPEED

Press **SP/EP** to set the tape speed.

9 RETURN TO NORMAL SCREEN

Press **PROG.** or **OK**. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

10 ENGAGE TIMER MODE

Press **TIMER**. The VCR turns off automatically and "⏲" is displayed on the display panel.

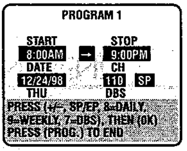
To Timer-Record Weekly Or Daily Serials . . .
. . . anytime during steps **3** through **9**, press **WEEKLY** (**NUMBER** key "9") for weekly serials or **DAILY** (**NUMBER** key "8") for daily serials (Monday–Friday). Either "WEEKLY" or "DAILY" appears on the screen. Pressing the button again makes the corresponding indication disappear.

NOTES:

- *To disengage the timer before recording starts, press **TIMER** again. Pressing once more re-engages it.*
- *In case of a power failure after programming, the VCR's memory backup keeps your selections for approximately 10 minutes.*
- *Programs that start after midnight must have the next day's date.*
- *After timer recording is completed, the VCR's power goes off automatically.*
- *You can program the timer while a regular recording is in progress; the on-screen menu will not be recorded.*
- *If the end of tape is reached during timer recording, the cassette is automatically ejected.*
- *When timer-recording cable or satellite channels through an external tuner, be sure to keep the cable box or satellite receiver's power ON.*

ATTENTION FOR DBS RECEIVER USERS

If you are using a DBS receiver (unless "DBS RECEIVER SET" is set to "OFF" ☞ pg. 20), the BAND indication (TV or CATV or DBS) appears under the channel number display. If the channel number that has been entered requires that the band be set, "7=DBS" is displayed on the screen. Press the **NUMBER** key "7" to select the desired band.


PROGRAM 1
START
STOP
8:00AM
→
9:00PM
DATE
CH
12/24/98
110
SP
THU
DBS
PRESS (+/–, SP/EP, 8=DAILY, 9=WEEKLY, 7=DBS), THEN (OK)
PRESS (PROG.) TO END

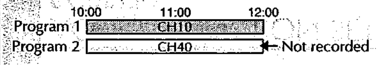
a– TV : To timer-record a regular TV program received on the VCR.
b– CATV : To timer-record a cable TV program received on the VCR, or through a cable box (unless "CABLE BOX SET" is set to "OFF" ☞ pg.17).
c– DBS : To timer-record a satellite program received through a DBS receiver.

- If "BAND" is set to "TV" at the Tuner Set screen (☞ pg.14) and "CABLE BOX SET" is set to "OFF" at the Cable Box Set screen (☞pg. 17), CATV will not be displayed on the Program screen; If "BAND" is set to "CATV" or "CABLE BOX SET" is set to "ON", TV will not be displayed.

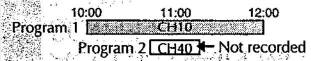
ATTENTION

If there is a conflict in the timer schedule and one program overlaps with another, only the parts shown below in gray will be recorded.

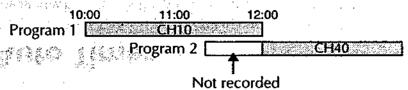
Pattern 1: *The program with the lower program number will be recorded.*

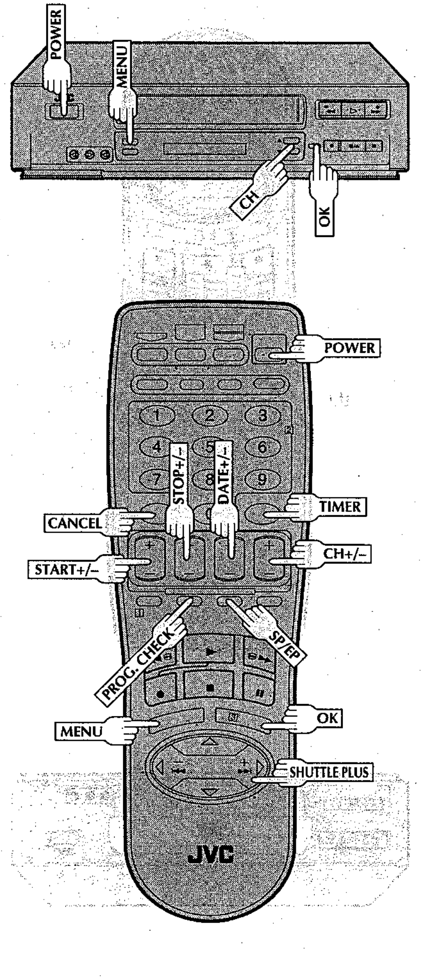

10:00
11:00
12:00
Program 1
CH10
Program 2
CH40
Not recorded

Pattern 2: *The program that is broadcast earlier will be recorded.*


10:00
11:00
12:00
Program 1
CH10
Program 2
CH40
Not recorded

Pattern 3: *The program that is broadcast earlier will be recorded, followed by the remaining portion of the other program.*


10:00
11:00
12:00
Program 1
CH10
Program 2
CH40
Not recorded



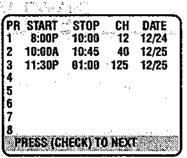
Check, Cancel And Revise Programs

1 DISENGAGE TIMER

Press **TIMER**, then press **POWER**.

2 ACCESS PROGRAM CHECK SCREEN

Press **PROG. CHECK**.



```
PR  START   STOP   CH   DATE
1    8:00P  10:00   12  12/24
2   10:00A  10:45   40  12/25
3   11:30P  01:00  125  12/25
4
5
6
7
8
 PRESS (CHECK) TO NEXT
```

3 ACCESS PROGRAM SCREEN

Press **PROG. CHECK** again to check more information. Each time you press **PROG. CHECK**, the next program's information appears.

To Cancel Or Revise A Program...

4 CANCEL OR REVISE A PROGRAM

To cancel a program, press **CANCEL**.
To revise a program, press the appropriate button: **START+/–**, **STOP+/–**, **DATE+/–**, **CH+/–**, **SP/EP**.

5 RETURN TO NORMAL SCREEN

Press **PROG. CHECK** as many times as necessary. If there are still programs remaining, go to step **6**.

6 RE-ENGAGE TIMER

Press **TIMER**.

Auto SP→EP Timer

If, when recording in SP mode, there is not enough tape to record the entire program, the VCR automatically switches to EP mode to allow complete recording. This feature is especially handy when recording a program of more than 2 hours in length.

For Example . . .
Recording a program of 140 minutes in length onto a 120-minute tape

Approximately 110 minutes	Approximately 30 minutes
SP mode	EP mode

Total 140 minutes

Make sure you set "AUTO SP→EP TIMER" to "ON" at the Function screen before the timer recording starts.

1 ACCESS MAIN MENU SCREEN

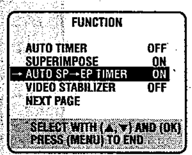
Press **MENU**.

2 ACCESS FUNCTION SET SCREEN

Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH ▲▼** or **SHUTTLE PLUS** △▽, then press **OK** or **SHUTTLE PLUS** ▷.

3 SELECT AUTO SP→EP TIMER SET MODE

Move the highlight bar (arrow) to "AUTO SP→EP TIMER" by pressing **CH ▲▼** or **SHUTTLE PLUS** △▽, then press **OK** or **SHUTTLE PLUS** ▷ to set to "ON".



```
            FUNCTION

  AUTO TIMER               OFF
  SUPERIMPOSE               ON
→ AUTO SP→EP TIMER          ON
  VIDEO STABILIZER         OFF
  NEXT PAGE

 SELECT WITH (▲,▼) AND (OK)
 PRESS (MENU) TO END
```

4 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTES:

- *If you have programmed the VCR to timer-record 2 or more programs, the second program and those thereafter may not fit on the tape if you set the Auto SP→EP Timer mode to "ON". In this case, make sure the mode is not engaged, then set the tape speed manually during timer programming.*
- *In order to ensure that the recording fits on the tape, this feature may leave a slight non-recorded section at the end of the tape.*
- *There may be some noise at the point on the tape where the VCR switches from SP to EP mode.*
- *The Auto SP→EP Timer feature is not available during ITR (Instant Timer Recording), and the feature will work with the following tapes: T(ST)-30, T(ST)-60, T(ST)-90, and T(ST)-120.*

Auto Timer

When the Auto Timer is set to ON the timer is automatically engaged when the VCR's power is turned off. It is automatically disengaged when the VCR is powered back on.

1 ACCESS MAIN MENU SCREEN

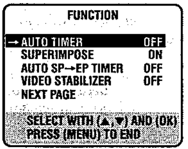
Press **MENU**.

2 ACCESS FUNCTION SET SCREEN

Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.

3 SELECT AUTO TIMER SET MODE

Move the highlight bar (arrow) to "AUTO TIMER" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷ to set to "ON" or "OFF".



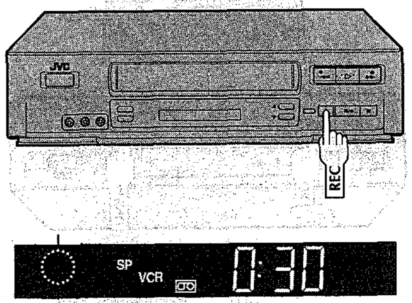
```
            FUNCTION

→ AUTO TIMER               OFF
  SUPERIMPOSE               ON
  AUTO SP→EP TIMER         OFF
  VIDEO STABILIZER         OFF
  NEXT PAGE

 SELECT WITH (▲,▼) AND (OK)
 PRESS (MENU) TO END
```

4 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTE:
For safety, when AUTO TIMER is set to "OFF", all other VCR functions are disabled while the Timer mode is engaged. To disengage the timer, press ***TIMER****.*

Instant Timer Recording (ITR)



This easy method lets you record from 30 minutes to 6 hours (selectable in 30-min. increments) and shuts the VCR off after recording is finished.

1 START RECORDING

Press **REC** on the front panel.

2 ENGAGE ITR MODE

Press **REC** again. " ○ " blinks and 0:30 appears on the front display panel.

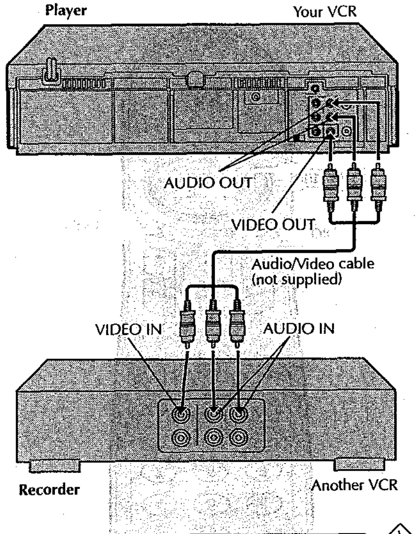
3 SET RECORDING DURATION

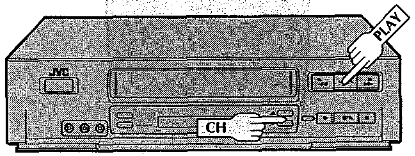
If you want to record for more than 30 minutes, press **REC** to extend the time. Each press extends recording time by 30 minutes.

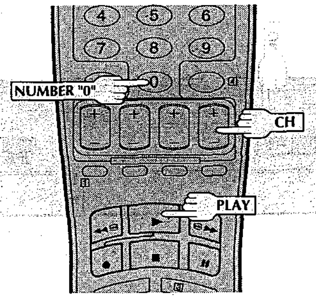
NOTES:

- *You can only perform ITR using the **REC** button on the VCR's front panel.*
- *After you set the ITR time, the previous display reappears.*
- *To check the remaining time, press **REC** once during recording and the remaining time will be displayed for about 5 seconds. Be careful not to press **REC** again within these 5 seconds, or you will round the recording time up to the next 30 minute increment.*

Edit To Or From Another VCR







You can use your VCR as the player or the recorder.

1 MAKE CONNECTIONS

Connect an AV cable between the player's VIDEO OUT and AUDIO OUT connectors and the recorder's VIDEO IN and AUDIO IN connectors.

- When using your VCR as the recorder and a monaural VCR as the player, connect the player's AUDIO OUT connector to the AUDIO IN L connector on the recorder.

2 LOAD CASSETTES

Insert the playback cassette into the player and the cassette to be recorded on into the recorder.

3 SET RECORDER'S INPUT MODE

Set to "AUX". With this VCR, press the **NUMBER** key "0" and/or **CH** to select depending on the connector being used – "L-1" for the rear AUDIO/VIDEO IN connector, or "F-1" for the front AUDIO/VIDEO IN connector.

4 START PLAYER

Set to its play mode.

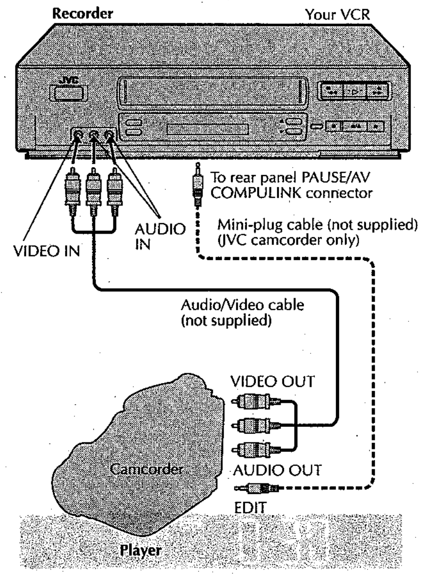
NOTE:

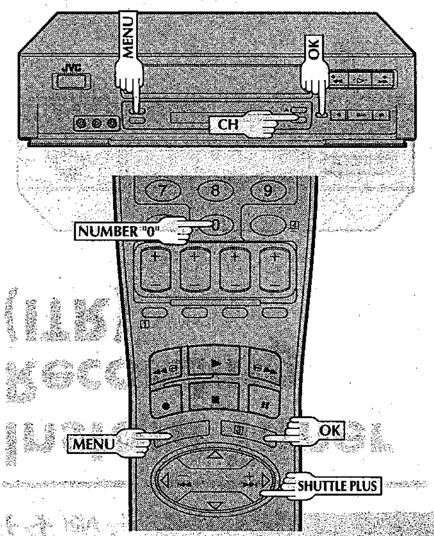
*If the player is equipped with a superimpose/OSD disable feature then set "SUPERIMPOSE" to OFF before pressing **PLAY** (☞ pg. 28).*

5 START RECORDER

Set to its record mode.

Edit From A Camcorder


Recorder
Your VCR
To rear panel PAUSE/AV COMPULINK connector
Mini-plug cable (not supplied) (JVC camcorder only)
VIDEO IN
AUDIO IN
Audio/Video cable (not supplied)
VIDEO OUT
AUDIO OUT
EDIT
Camcorder
Player


MENU
OK
CH
NUMBER "0"
MENU
OK
SHUTTLE PLUS

You can use a camcorder as the player and your VCR as the recorder.

1 MAKE CONNECTIONS

Connect an AV cable between the camcorder's VIDEO OUT and AUDIO OUT connectors and your VCR's VIDEO IN and AUDIO IN connectors.

- When a Master Edit Control-equipped JVC camcorder is used, the camcorder is capable of controlling your VCR. The mini-plug cable is a mono 3.5 mm mini-plug to mono 3.5 mm mini-plug connector.
- If connecting to a camcorder with a monaural output, connect the audio output connector on the camcorder to AUDIO IN L of the VCR.

2 LOAD A CASSETTE

Insert the cassette to be recorded on into the recorder.

3 SET RECORDER'S INPUT MODE

Set to "AUX". Press the **NUMBER** key "0" and/or **CH** to select depending on the connector being used – "L-1" for the rear AUDIO/VIDEO IN connector, or "F-1" for the front AUDIO/VIDEO IN connector.

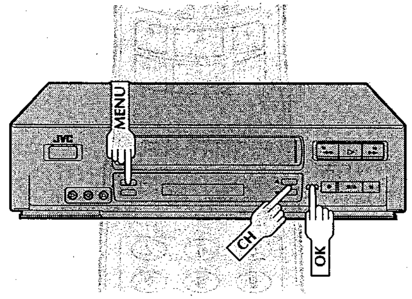
*If you're using a JVC Master Edit Control-equipped camcorder — step **4***
*If not — step **8***

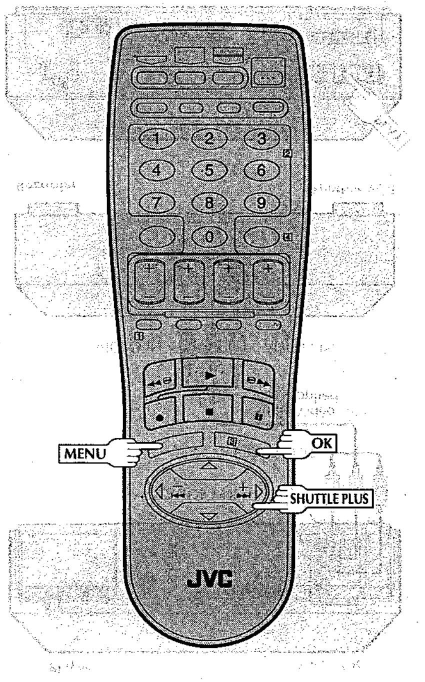
4 ACCESS MAIN MENU SCREEN

Press **MENU**.

5 ACCESS FUNCTION SET SCREEN

Press **CH ▲▼** or **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "FUNCTION SET", then press **OK** or **SHUTTLE PLUS ▷**.

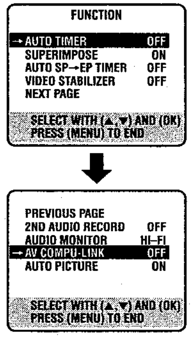



MENU
OK
SHUTTLE PLUS
JVC

6 ENABLE REMOTE PAUSE FUNCTION

Press **CH ▲▼** or **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "AV COMPU-LINK", then press **OK** or **SHUTTLE PLUS ▷** to set to "OFF".

- The PAUSE/AV COMPU-LINK connector works as the AV Compulink Playback connector when "AV COMPU-LINK" is set to "ON" (☞ pg. 31), and works as the Remote Pause connector when "AV COMPU-LINK" is set to "OFF".



FUNCTION

→ AUTO TIMER OFF
SUPERIMPOSE ON
AUTO SP→EP TIMER OFF
VIDEO STABILIZER OFF
NEXT PAGE

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

PREVIOUS PAGE
2ND AUDIO RECORD OFF
AUDIO MONITOR HI–FI
→ AV COMPU-LINK OFF
AUTO PICTURE ON

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

7 RETURN TO NORMAL SCREEN

Press **MENU**.

8 START PLAYER

Set the camcorder to its play mode.

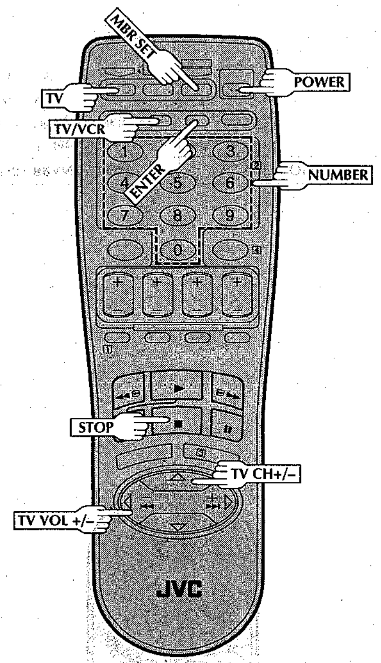
NOTE:

If the camcorder is equipped with a superimpose/OSD disable feature then set its superimpose or display feature to OFF before pressing play.

9 START RECORDER

Set your VCR to its record mode.

- If you are using a Master Edit Control-equipped JVC camcorder, it can put the recorder automatically into Record mode. (Refer to camcorder's instruction manual.)



TV BRAND NAME	BRAND CODE
JVC	01
MAGNAVOX	02
MITSUBISHI	03
PANASONIC	04, 11
RCA	05
SHARP	06
SONY	07
TOSHIBA	08
ZENITH	09
HITACHI	10
SAMSUNG	12
SANYO	13
SEARS	13

TV Multi-Brand Remote Control

The VCR's remote control can control several functions on JVC remote control TVs and on the brands of remote control TVs listed below. *The default setting is JVC code 01.

1 TURN ON THE TV

Turn the power on using the TV's remote control.

2 SET TV BRAND CODE

Refer to the chart in the left column. While holding down **TV** on the VCR's remote control, press **MBR SET** and enter your TV's brand code using the **NUMBER** keys, then press **STOP**.
Follow the example shown below.
Check if the TV's power goes off as it should. If it does, try other operations (☞ step 3).

- Once you have set the remote control to operate the TV, you don't have to repeat this step until you replace your remote control's batteries.
- PANASONIC has two codes. If the TV does not function with one code, try entering the other.

3 OPERATE TV

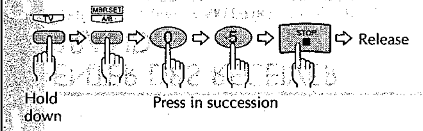
First, while holding down **TV**, press the corresponding button: **POWER**, **TV CH +/–**, **TV/VCR**, **TV VOL +/–**, **NUMBER** keys.

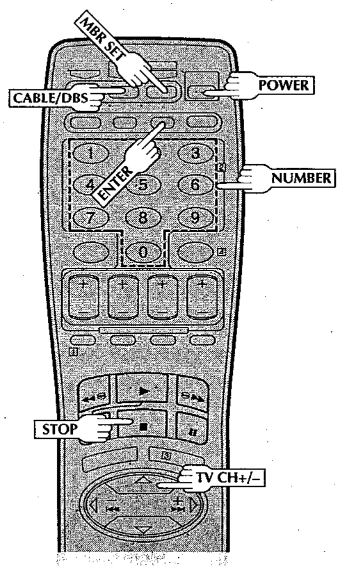
- For some brands of TV, you must press **ENTER** after having pressed the **NUMBER** keys.

NOTE:

Depending on the type of TV, there may be cases where some or all functions cannot be operated using the remote control.

(Ex.) To set remote control to RCA 05:





CABLE BOX BRAND NAME	BRAND CODE
ARCHER	01, 05, 17
CABLETENNA	01, 17
CABLEVIEW	15, 16, 17, 21, 25
CITIZEN	15, 16, 17, 21, 25
CURTIS	02
DIAMOND	01, 17
EASTERN	19
GC BRAND	15, 16, 17, 21, 25
GEMINI	15
GENERAL INSTRUMENTS	01, 04, 06, 11, 12, 15
HAMLIN	10, 18, 19, 23
JASCO	15
JERROLD	01, 04, 06, 11, 12, 15
NOVAVISION	02
OAK	07
PANASONIC	13, 14
PULSER	15, 16, 17, 21, 25
RCA	13, 14
REGAL	10, 18, 19, 23
REGENCY	19
REMBRANDT	01, 16, 17
SAMSUNG	05, 16, 24
SCIENTIFIC ATLANTA	02
SIGMA	07
SL MARX	05, 16, 17, 24, 25
SPRUCER	13, 14
STARGATE	05, 15, 16, 17, 21, 24, 25
TELEVIEW	05, 16, 24
TOCOM	01, 04, 16
UNIKA	01, 17
UNIVERSAL	16, 17, 25
VIDEOWAY	03, 09, 22
ZENITH	03, 09, 22

Cable Box Multi-Brand Remote Control

The VCR's remote control can control functions on the brands of cable boxes listed below. Some cable box brands have more than one code. If your cable box does not function with a specified code, try other codes.

1 TURN ON THE CABLE BOX

Turn the power on using the cable box's remote control.

2 ENTER CABLE BOX BRAND

While holding down **CABLE/DBS** on the VCR's remote control, press **MBR SET** and use the **NUMBER** keys to enter the cable box brand number from the chart in the left column and then press **STOP**.
Follow the example shown below.
Check if the cable box's power goes off as it should. If it does, try other operations (☞ step 3).

- Once you have set the remote control to operate the cable box, you don't have to repeat this step until you replace the remote control's batteries.

3 OPERATE CABLE BOX

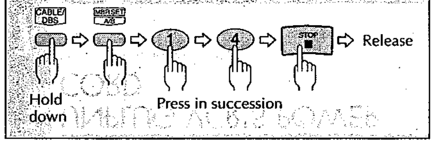
First, while holding down **CABLE/DBS**, press the corresponding button: **POWER**, **TV CH +/–**, **NUMBER** keys.

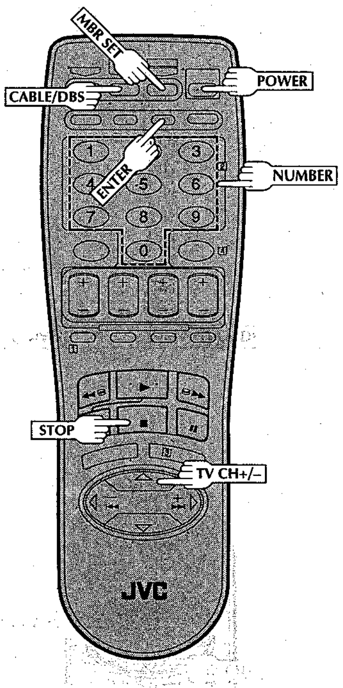
- For some brands of cable box, you must press **ENTER** after having pressed the **NUMBER** keys.
- To change the cable box's channel, press **TV CH +/–** or the **NUMBER** keys. (The **CH +/–** button can be used to change the VCR's channel only.)

NOTES:

- *Depending on the type of cable box, there may be cases where some or all functions cannot be operated using the remote control.*
- *It's not possible to set the remote control for both your cable box and a DBS receiver at the same time. You can only set the remote control to operate one of these units at a time.*

(Ex.) To set remote control to RCA 14:





DBS Receiver Multi-Brand Remote Control

The VCR's remote control can control functions on the brands of DBS (Direct Broadcast Satellite) receivers listed below.

1 TURN ON THE DBS RECEIVER

Turn the power on using the DBS receiver's remote control.

2 ENTER DBS RECEIVER BRAND

While holding down **CABLE/DBS** on the VCR's remote control, press **MBR SET** and use the **NUMBER** keys to enter the DBS receiver brand number from the chart in the left column and then press **STOP**.
Follow the example shown below.
Check if the DBS receiver's power goes off as it should. If it does, try other operations (☞ step 3).

- Once you have set the remote control to operate the DBS receiver, you don't have to repeat this step until you replace the remote control's batteries.

3 OPERATE DBS RECEIVER

First, while holding down **CABLE/DBS**, press the corresponding button: **POWER**, **TV CH +/–**, **NUMBER** keys.

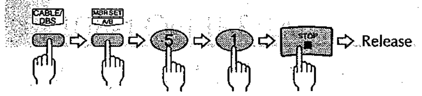
- Depending on the DBS receiver you may have to press **ENTER** after having pressed the **NUMBER** keys.
- To change the DBS receiver's channel, press **TV CH +/–** or the **NUMBER** keys. (The **CH +/–** button can be used to change the VCR's channel only.)

NOTES:

- *Depending on the type of DBS receiver, there may be cases where some or all functions cannot be operated using the remote control.*
- *It's not possible to operate a DBS receiver that is not equipped with a remote control sensor.*
- *Though ECHOSTAR has a number of different remote codes, this remote control is applicable only to one of those codes preset at the factory.*
- *It's not possible to set the remote control for both your DBS receiver and a cable box at the same time. You can only set the remote control to operate one of these units at a time.*

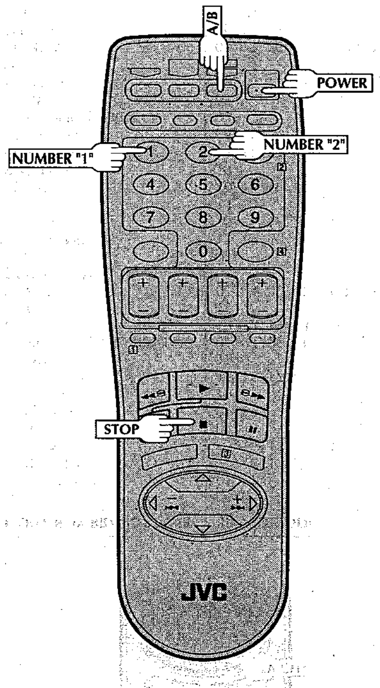
DBS BRAND NAME	BRAND CODE
JVC (DISH Network)	51
ECHOSTAR (DISH Network)	51
PRIMESTAR	50
SONY (DSS)	41
RCA (DSS)	40

(Ex.) To set remote control to JVC 51:



Hold down

Press in succession



Control Two JVC VCRs

The remote control is capable of controlling two JVC VCRs independently; one set to respond to your remote control's **A** code control signals and another set to respond to **B** code control signals. The remote control is preset to send **A** code signals because your VCR is initially set to respond to **A** code signals. You can easily modify your VCR to respond to **B** code signals.

1 UNPLUG VCR'S POWER CORD

Unplug from the AC outlet.

2 SET REMOTE CONTROL CODE

While holding down **A/B** on the remote control, press the **NUMBER** key "2" and then press **STOP**.

3 PLUG IN POWER CORD

Plug back in to the AC outlet.

4 TURN VCR POWER ON

Press **POWER** on the remote.

The VCR will now respond only to B-code commands.
To set the VCR back to respond to A code signals, repeat the same procedure as shown above except pressing **NUMBER** key "1" instead of "2" in step **2**.
You can control two VCRs with the same remote control by switching the remote's code between A and B (☞ Step 2).

Before requesting service for a problem, use this chart and see if you can repair the trouble yourself. Small problems are often easily corrected, and this can save you the trouble of sending your VCR off for repair.

POWER

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The power won't come on.	• The power cord is disconnected.	Connect the power cord.
2. The clock works, but the VCR's power won't come on.	• The TIMER mode is engaged with Auto Timer set to "OFF" (☞ pg. 43).	Press **TIMER** to disengage.
3. The remote control won't function.	• The batteries are discharged.	Replace the dead batteries with new ones. Set the switch to the position.

TAPE TRANSPORT

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The cassette gets stuck partway during loading, and is ejected.	• The cassette was inserted incorrectly.	Make sure the cassette's window is facing up, the rear label side is facing you and the arrow on the front of the cassette is pointing towards the VCR. Then insert the cassette.

PLAYBACK

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The tape is running but the picture won't appear.	• If you're using the RF OUT connection (☞ pg. 6), the channel selector on the TV is set incorrectly. • If you're using the AV connection (☞ pg. 6), the TV receiver is set to the wrong mode.	Set the channel selector to channel 3 or 4. Set the TV receiver to its AV mode.
2. Noise appears during visual search.	• This is normal.	
3. Breaks are noticeable in Hi-Fi soundtrack.	• Automatic tracking is engaged.	Disengage Auto Tracking and adjust the tracking manually (☞ pg. 25).
4. The playback picture is blurred or interrupted, even though TV broadcasts are clear.	• The video heads may be dirty.	The heads must be cleaned. Consult your JVC dealer.
5. The Hi-Fi soundtrack cannot be heard.	• The AUDIO MONITOR option was set incorrectly.	Set AUDIO MONITOR to "HI-FI" (☞ pg. 29).

RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Recording won't start.	• There's no cassette loaded. • The loaded cassette has had its record safety tab removed.	Insert a cassette. Remove the cassette and cover the hole with adhesive tape, or load a cassette on which the record safety tab is intact.
2. TV broadcasts won't record properly.	• The VCR has been set to its AUX mode by mistake.	Set the VCR to the appropriate channel.
3. Tape-to-tape editing won't work.	• The VCRs or the camcorder and the VCR have been incorrectly connected. • The power to one or more of the units has not been turned on. • The recorder's input mode has been set incorrectly.	Refer to the directions and the illustration under "Edit To Or From Another VCR" (☞ pg. 45) or "Edit From A Camcorder" (☞ pg. 46) and properly connect the units. Make sure the power to all units is on. Select the recorder's appropriate input mode.

TIMER RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Timer recording won't work.	• The clock and/or the timer have been set incorrectly. • The timer is not engaged. • The VCR has not been set up properly.	Set the clock and/or timer correctly. Press **TIMER** and check to make sure that ⊙ appears on the front display panel. Re-perform the set-up procedures. Make sure you have compensated for Guide Channel and VCR or cable box channel number mismatches (☞ pg. 38).
2. Timer programming won't work.	• Timer recording is in progress.	Timer programming can't be performed when timer recording is in progress. Wait until it finishes.
3. ⊙ and 📼 on the front display panel won't stop blinking.	• The timer is engaged but there's no cassette loaded.	Load a cassette with the record safety tab intact, or with the hole covered with adhesive tape.
4. The cassette is automatically ejected, and ⊙ and 📼 on the front display panel won't stop blinking.	• The loaded cassette has had its record safety tab removed.	Remove the cassette and cover its hole with adhesive tape, or replace it with a cassette on which the safety tab is intact.
5. ⊙ blinks for 10 seconds and the timer mode is disengaged.	• **TIMER** has been pressed when there are no programs in memory, or the timer record program information has not been programmed correctly.	Check the programmed data and re-program as necessary, then press **TIMER** again.
6. The cassette is automatically ejected, the power shuts off and ⊙ and 📼 won't stop blinking.	• The end of tape was reached during timer recording.	The program may not have been recorded in its entirety. Next time make sure you have enough time on the tape to record the entire program.
7. Cable channels are not automatically switched during timer recording.	• The Controller is not properly connected to the VCR. • The output channel selected in the Cable Box Set screen is incorrect. • The cable box's power is off.	Connect the Controller correctly (☞ pg. 16). After confirming your cable box's output channel number, re-access the Cable Box Set screen and select the correct number (☞ pg. 17). Make sure the power is on before timer recording starts.
8. Satellite channels are not automatically switched during timer recording.	• The Controller is not properly connected to the VCR. • The output channel selected in the DBS Receiver Set screen is incorrect. • The VCR is not set correctly to control the DBS Receiver • The DBS receiver's power is off.	Connect the Controller correctly (☞ pg. 19). After confirming your DBS receiver's output channel number, re-access the DBS Receiver Set screen and select the correct number (☞ pg. 20). Set the correct DBS Receiver brand code (☞ pg. 21). Make sure the power is on before timer recording starts.
9. Timer recording begins as scheduled, but the channel is always incorrect.	• Even though you don't use an external Cable Box, "CABLE BOX SET" is set to "ON".	Set "CABLE BOX SET" to "OFF" (☞ pg. 17).
10. We moved, and now VCR Plus+ doesn't work properly.	• The receivable stations in the new area are received on different channels than those in the previous area.	Re-perform the VCR Plus+ setup procedure (☞ pg. 38).
11. "PROGRAM FULL" is displayed on the screen.	• All 8 programs of the VCR's timer memory are used.	Wait until a space in memory clears, or cancel unnecessary program information (☞ pg. 42).

CONTINUED ON NEXT PAGE

OTHER PROBLEMS

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. When scanning channels, some of them are skipped over.	• Those channels have been preset to be skipped.	If you need the skipped channels, restore them (☞ pg. 15).
2. The channel can't be changed.	• Recording is in progress.	Press **PAUSE** to pause the recording, change channels, then press **PLAY** to resume recording.
3. The remote control won't operate my TV or cable box or DBS receiver.	• The remote control brand setting is incorrect.	Re-set the remote control to the correct brand (☞ pg. 48 or 49 or 50).
4. Even though Auto or Semi-Auto clock setting has been selected, the clock is incorrect.	• The clock setting data received from the Host Channel is incorrect.	Select a different Host Channel during the Semi-Auto setting procedure (☞ pg. 12), or perform the Manual setting procedure (☞ pg. 13).

ATTENTION:
This VCR contains microcomputers. External electronic noise or interference can cause microcomputer to malfunction. If the VCR does not operate correctly switch its power off and unplug the power cord from the AC supply. Wait for a while and then plug the power back in. Eject and check the condition of the cassette. If everything appears normal resume operating the VCR as usual.

PLAYBACK

Q. What happens if the end of the tape is reached during playback or search?
A. The tape is automatically rewound to the beginning.

Q. Can the VCR indefinitely remain in the still mode?
A. No. It stops automatically after 5 minutes to protect the heads.

Q. During search, slow, still and frame-by-frame playback, I can't hear any audio. What's the problem?
A. This is normal.

Q. During search, still and frame-by-frame playback, the picture is intermittent. What's the cause?
A. Picture loss occurs when these types of playback are attempted with a tape recorded in LP mode. Pressing **PLAY** to return to normal playback will restore the picture.

Q. When returning from multi-speed search to normal playback, the picture is disturbed. Should I be concerned about this?
A. No, it is normal.

Q. Noise bars appear during multi-speed search. What's the problem?
A. This is normal.

Q. When playing back programs that have been timer-recorded with consecutive times (such one program from 8:00 to 9:00 and another one from 9:00 to 10:00), the picture and sound become momentarily distorted at the point where the first program ends and the second program begins. Is this a malfunction?
A. No. This is normal.

Q. Other than preventing further recording, what effect does removing the safety tab have?
A. It disables marking of index codes.

Q. Sometimes, during Index Search, the VCR can't find the program I want to see. Why not?
A. There may be index codes too close together.

Q. During playback, on-screen operational indicators sometimes jitter. Why does this happen?
A. If the condition of the tape being played back is not good, jittering of the video (including on-screen indicators) may occur.

RECORDING

Q. When I pause and then resume a recording, the end of the recording before the pause is overlapped by the new recording. Why does this happen?
A. This is normal. It reduces distortion at the pause and resume points.

Q. Can the VCR indefinitely remain in the Record-Pause mode?
A. No. The VCR automatically goes to its Stop mode after 5 minutes to protect the heads. When paused during Instant Timer Recording (ITR), the VCR shuts off automatically after 5 minutes.

Q. What happens if the tape runs out during recording?
A. The VCR automatically rewinds it to the beginning.

TIMER RECORDING

Q. REC and ⊙ remain lit on the front display panel. Is there a problem?
A. No. This is a normal condition for a timer recording in progress.

Q. Can I program the timer while I'm watching a tape or a TV broadcast?
A. Yes, but while you are setting the timer you won't see the tape's or broadcast program's picture as it is replaced by the on-screen menu. The audio from the tape or broadcast program will be present during the setting of the timer.

List Of Terms

This guide serves as a quick way to locate frequently used terms and on-screen display names.

A
A/B Code 51
Add Channel 15
Audio Monitor 29
Auto Channel Setting 14
Auto Daylight Saving Time 12
Auto Picture 32
Auto SP→EP Timer 43
Auto Timer 43
Automatic Tracking 25
Aux Input 45
AV Compu Link Playback 31
AV Connection 6

B
Band 14

C
Cable Box 16
Cable Box Brand Setting 18
Cable Box Controller 16
Cancel Program 42
Cassette Adapter 22
Check Program 42
Connection to TV 6
Contents 5
Counter Reset 27

D
DBS Receiver 19
DBS Receiver Brand Setting 21
DBS Receiver Controller 19
Delete Channel 15

E
Editing 45
Express Timer Programming 40
Express Timer Recording 40

F
Frame-by-Frame Playback 24

G
Guide Channel Setting 39

H
Host Channel Selection 12

I
Index Search 25
Insert Cassette 22
Instant ReView 25
ITR (Instant Timer Recording) 44

L
Language Selection 10

M
Main Menu 10
Manual Channel Setting 15
Manual Clock Setting 13
Manual Tracking 25
MBR (Multi-Brand Remote) Code Setting 48
Movie Advance 30

N
Next-Function Memory 27

O
On-Screen Display 28

P
PBS Channel 8
Playback 22
Plug & Play 8

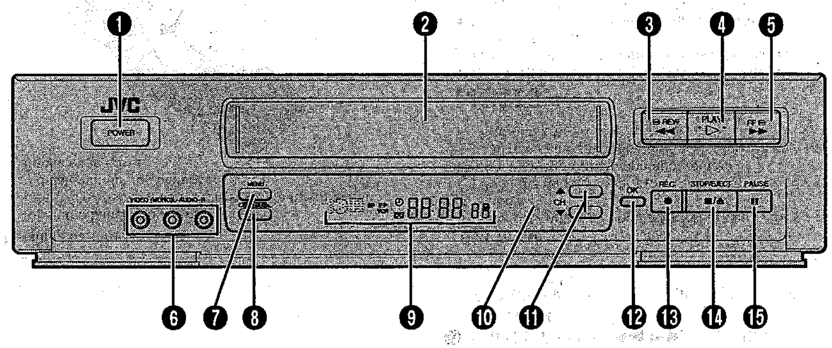
R
Record Safety Tab 23
Recording 23
Repeat Playback 27
Reverse Motion Playback 24
Reverse Slow Motion Playback 24
RF Connection 6

S
SAP (Second Audio Program) 35
Second Audio 35
Select Cable Box Output Channel 17
Select DBS Receiver Output Channel 20
Semi-Auto Clock Setting 12
Skip Search 25
Slow Motion Playback 24
Specifications 60
SQPB (S-VHS Quasi Play Back) 22
Still Picture Playback 24
Superimpose 28

T
Tape Position Indicator 27
Tape Speed Setting 23
Time Zone Selection 13
Tuner Setting 14

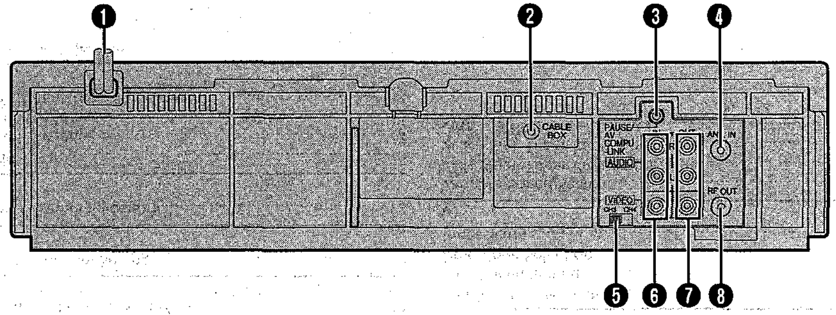
V
Variable-Speed Search 24
VCR Plus+ Timer Programming 36
VCR Plus+ Timer Recording 36
Video Stabilizer 26

FRONT VIEW



❶ Power On/Off Button (☞ pg. 10)
❷ Cassette Loading Slot
❸ Rewind [REW] Button (☞ pg. 22)
❹ PLAY Button (☞ pg. 22)
❺ Fast-Forward [FF] Button (☞ pg. 22)
❻ VIDEO/AUDIO Input Connectors (☞ pg. 46)
❼ MENU Button (☞ pg. 10)
❽ Instant REVIEW Button (☞ pg. 25)
❾ Front Display Panel (☞ pg. 58)
❿ Remote Control Sensor
⓫ Channel [CH] ▲▼ Button (☞ pg. 23)
⓬ OK Button (☞ pg. 10)
⓭ Record [REC] Button (☞ pg. 23)
⓮ STOP/EJECT Button (☞ pg. 22)
⓯ PAUSE Button (☞ pg. 24)

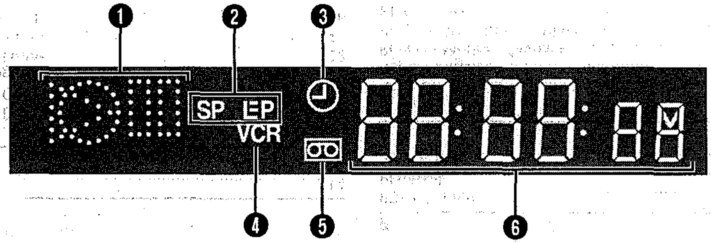
REAR VIEW



① Power Cord (☞ pg. 6)
② CABLE BOX Controller Connector (☞ pg. 16, 19)
③ PAUSE/AV COMPULINK Connector
- Remote PAUSE Connector (☞ pg. 46)
- AV COMPU-LINK Connector (☞ pg. 31)

④ ANT. IN Connector (☞ pg. 6)
⑤ Channel 3/4 Switch (☞ pg. 6)
⑥ VIDEO/AUDIO Input Connectors (☞ pg. 45)
⑦ VIDEO/AUDIO Output Connectors (☞ pg. 45)
⑧ RF OUT Connector (☞ pg. 6)

FRONT DISPLAY PANEL

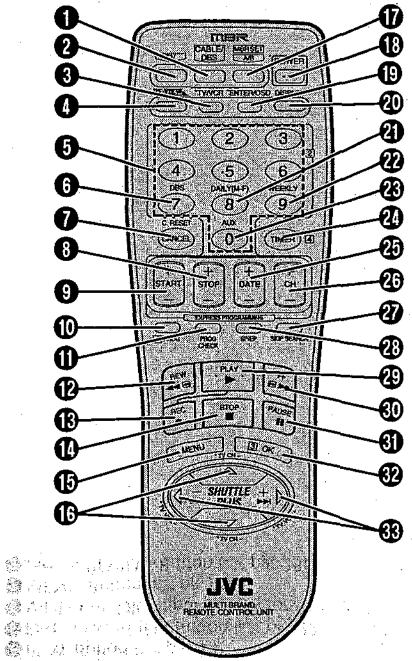


① Symbolic Mode Indicators

PLAY: FF/REW VARIABLE SEARCH:	▷	STILL: SLOW:	▷▥
		RECORD:	○
		RECORD PAUSE:	○▥

② Tape Speed Indicators (☞ pg. 23)
③ Timer Mode Indicator
④ VCR Mode Indicator (☞ pg. 34)
⑤ "Cassette Loaded" Mark
⑥ Channel Display ["L-1" and "F-1" for AUX model]
Counter Display (☞ pg. 8)
Clock Display (☞ pg. 8)

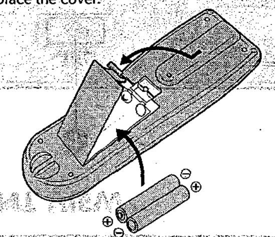
REMOTE CONTROL



Buttons with a small dot on the left side of the name can also be used to operate your TV while holding down the **TV** button. ☞ pg. 48

① CABLE/DBS Button (☞ pg. 49, 50)
② TV Button (☞ pg. 48)
③ TV/VCR Button (☞ pg. 34)
④ Instant REVIEW Button (☞ pg. 25)
⑤ NUMBER Buttons (☞ pg. 23, 36)
⑥ DBS Button (☞ pg. 41)
⑦ CANCEL Button (☞ pg. 42)
Counter [C.] RESET Button (☞ pg. 27)
⑧ STOP +/– Button (☞ pg. 40)
⑨ START +/– Button (☞ pg. 40)
⑩ PROG. Button (☞ pg. 36, 40)
⑪ PROG. CHECK Button (☞ pg. 42)
⑫ Rewind [REW] Button (☞ pg. 22)
⑬ Record [REC] Button (☞ pg. 23)
⑭ STOP Button (☞ pg. 22)
⑮ MENU Button (☞ pg. 10)
⑯ SHUTTLE PLUS △▽ Button (☞ pg. 10)
TV Channel [CH] +/– Button (☞ pg. 48, 49, 50)
⑰ MBR SET Button (☞ pg. 48, 49, 50)
A/B Code Button (☞ pg. 51)
⑱ POWER On/Off Button (☞ pg. 10)
⑲ ENTER Button (☞ pg. 23)
On-Screen Display [OSD] Button (☞ pg. 28)
⑳ DISPLAY Button (☞ pg. 27)
㉑ DAILY Timer Recording Button (☞ pg. 37, 41)
㉒ WEEKLY Timer Recording Button (☞ pg. 37, 41)
㉓ "AUX" Mode Select Button (☞ pg. 45)
㉔ TIMER Button (☞ pg. 37, 41)
㉕ DATE +/– Button (☞ pg. 40)
㉖ Channel [CH] +/– Button (☞ pg. 23, 40)
㉗ SKIP SEARCH Button (☞ pg. 25, 30)
㉘ Recording Speed [SP/EP] Button (☞ pg. 23)
㉙ PLAY Button (☞ pg. 22)
㉚ Fast-Foward [FF] Button (☞ pg. 22)
㉛ PAUSE Button (☞ pg. 24)
㉜ OK Button (☞ pg. 10)
㉝ SHUTTLE PLUS ◀◀ ▶▶ (◁ ▷) Button (☞ pg. 24, 25)
TV Volume [VOL.] +/– Button (☞ pg. 48)

Installing Batteries
1. Open the battery compartment cover.
2. Insert 2 "AA"-size batteries (provided) in the direction indicated under the battery cover.
3. Replace the cover.



How To Use

The remote control can operate most of your VCR's functions.
1. Point the remote control toward the sensor window.
2. Press the appropriate operation button.
3. The maximum operating distance of the remote control is about 8 m.

NOTES:

- *This remote control can also operate various brands of TVs, Cable Boxes and DBS Receivers. For instructions,* ☞ *pg. 48 – 50.*
- *If the remote control doesn't work properly, remove its batteries, wait a short time, replace the batteries and then try again.*

GENERAL

Power requirement	: AC 120 V∿, 60 Hz
Power consumption	
Power on	: 22 W
Power off	: 3 W
Temperature	
Operating	: 5°C to 40°C (41°F to 104°F)
Storage	: –20°C to 60°C (–4°F to140°F)
Operating position	: Horizontal only
Dimensions (W x H x D)	: 400 x 94 x 273 mm (15-3/4" x 3-3/4" x 10-3/4")
Weight	: 3.1 kg (6.9 lbs)
Format	: VHS NTSC standard
Maximum recording time	
SP	: 210 min. with ST-210 video cassette
EP	: 630 min. with ST-210 video cassette

VIDEO/AUDIO

Signal system	: NTSC-type color signal and EIA monochrome signal, 525 lines/60 fields
Recording/ Playback system	: DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 240 lines
Frequency range	
Normal audio	: 70 Hz to 10,000 Hz
Hi-Fi audio	: 20 Hz to 20,000 Hz
Input/Output	: RCA connectors (IN x 2, OUT x 1)

TUNER

Tuning system	: Frequency-synthesized tuner
Channel coverage	
VHF	: Channels 2–13
UHF	: Channels 14–69
CATV	: 113 Channels
RF output	: Channel 3 or 4 (switchable; preset to Channel 3 when shipped) 75 ohms, unbalanced

TIMER

Clock reference	: Quartz
Program capacity	: 1-year programmable timer/ 8 programs
Memory backup time	: Approx. 10 min.

ACCESSORIES

Provided accessories	: RF cable (F-type), Infrared remote control unit, "AA" battery x 2, Controller

Specifications shown are for SP mode unless otherwise specified. E. & O.E. Design and specifications subject to change without notice.

HOW TO LOCATE YOUR JVC SERVICE CENTER

TOLL FREE: 1-800-252-5722

Dear customer:

In order to receive the most satisfaction from your purchase, read the instruction booklet before operating the unit. In the event that repair is necessary, or for the address nearest your location, please refer to the factory service center list below or within the Continental United States, call 1-800-252-5722 for your authorized servicer. Remember to retain your Bill of Sale for Warranty Service.

— JVC

JVC SERVICE & ENGINEERING COMPANY OF AMERICA
DIVISION OF US JVC CORP.

FACTORY SERVICE CENTER LOCATIONS

107 Little Falls Road
Fairfield, NJ 07004-2105
(973) 808-9279

1500 Lakes Parkway
Lawrenceville, GA 30243-5857
(770) 339-2522

705 Enterprise Street
Aurora, IL 60504-8135
(630) 851-7855

5665 Corporate Avenue
Cypress, CA 90630-4727
(714) 229-8011

10700 Hammerly Boulevard, Suite 110
Houston, TX 77043-2310
(713) 935-9331

2969 Mapunapuna Place, Suite 101
Honolulu, HI 96819-2000
(808) 833-5828

230 Eliot Street
Ashland, MA 01721-2377
(508) 881-5923

8192 W State Road 84
Davie, FL 33324-4611
(954) 472-1960

890 Dubuque Avenue
South San Francisco, CA 94080-1804
(415) 871-2666

Sophisticated electronic products may require occasional service. Just as quality is a keyword in the engineering and production of the wide array of JVC products, service is the key to maintaining the high level performance for which JVC is world famous. The JVC service and engineering organization stands behind our products.

NATIONAL HEADQUARTERS
JVC SERVICE & ENGINEERING COMPANY OF AMERICA
DIVISION OF US JVC CORP.
107 Little Falls Road
Fairfield, NJ 07004-2105

If you ship the product...

Pack your JVC unit in the original carton or one of equivalent size and strength. Enclose, with the unit, a letter stating the problem or symptom that exists and also a copy of the receipt or bill of sale you received when you purchased your JVC unit. Print your home return address on the outside and the inside of the carton. Send to the appropriate JVC Factory Service Center as listed above.

ACCESSORIES

To purchase accessories for your JVC product, you may contact your local JVC Dealer.
Or from the 48 Continental United States call toll free:
1-800-882-2345.

Don't service it yourself.

CAUTION

To prevent electrical shock, do not open the cabinet. No user serviceable parts inside.
Refer servicing to qualified service personnel.

LIMITED WARRANTY

CONSUMER VIDEO 1-90

JVC COMPANY OF AMERICA warrants this product and all parts thereof, except as set forth below ONLY TO THE ORIGINAL PURCHASER AT RETAIL to be FREE FROM DEFECTIVE MATERIALS AND WORKMANSHIP from the date of original retail purchase for the period as shown below. ("The Warranty Period")

PARTS	LABOR
1 YR	90 DAYS

THIS LIMITED WARRANTY IS VALID ONLY IN THE FIFTY (50) UNITED STATES, THE DISTRICT OF COLUMBIA AND IN COMMONWEALTH OF PUERTO RICO.

WHAT WE WILL DO:
If this product is found to be defective, JVC will repair or replace defective parts at no charge to the original owner. Such repair and replacement services shall be rendered by JVC during normal business hours at JVC authorized service centers. Parts used for replacement are warranted only for the remainder of the Warranty Period. All products and parts thereof may be brought to a JVC authorized service center on a carry-in basis except for Television sets having a screen size 25 inches and above which are covered on an in-home basis.

WHAT YOU MUST DO FOR WARRANTY SERVICE:
Return your product to a JVC authorized service center with a copy of your bill of sale. For your nearest JVC authorized service center, please call toll free: (800) 252-5722.

If service is not available locally, box the product carefully, preferably in the original carton, and ship, insured, with a copy of your bill of sale plus a letter of explanation of the problem to the nearest JVC Factory Service Center, the name and location of which will be given to you by the toll-free number.

If you have any questions concerning your JVC Product, please contact our Customer Relations Department.

WHAT IS NOT COVERED:
This limited warranty provided by JVC does not cover:

1. Products which have been subject to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, or if repaired or serviced by anyone other than a service facility authorized by JVC to render such service, or if affixed to any attachment not provided with the products, or if the model or serial number has been altered, tampered with, defaced or removed;
2. Initial installation and installation and removal for repair;
3. Operational adjustments covered in the Owner's Manual, normal maintenance, video and audio head cleaning;
4. Damage that occurs in shipment, due to act of God, and cosmetic damage;
5. Signal reception problems and failures due to line power surge;
6. Video Pick-up Tubes/CCD Image Sensor, Cartridge, Stylus (Needle) are covered for 90 days from the date of purchase;
7. Accessories;
8. Batteries (except that Rechargeable Batteries are covered for 90 days from the date of purchase); from the date of purchase);

There are no other express warranties except as listed above.

THE DURATION OF ANY IMPLIED WARRANTIES INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN.

JVC SHALL NOT BE LIABLE FOR THE LOSS OF USE OF THE PRODUCT, INCONVENIENCE, LOSS OR ANY OTHER DAMAGES, WHETHER DIRECT, INCIDENTAL OR CONSEQUENTIAL (INCLUDING, WITHOUT LIMITATION, DAMAGE TO TAPES, RECORDS OR DISCS) RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF ANY BREACH OF THIS WARRANTY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ARE LIMITED TO THE WARRANTY PERIOD SET FORTH ABOVE.

Some states do not allow the exclusion of incidental or consequential dameges or limitations on how long an implied warranty lasts, so these limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

JVC COMPANY OF AMERICA
DIVISION OF US JVC CORP.

41 Slater Drive
Elmwood Park, New Jersey 07407

REFURBISHED PRODUCTS CARRY A SEPARATE WARRANTY, THIS WARRANTY DOES NOT APPLY. FOR DETAILS OF REFURBISHED PRODUCT WARRANTY, PLEASE REFER TO THE REFURBISHED PRODUCT WARRANTY INFORMATION PACKAGED WITH EACH REFURBISHED PRODUCT.

For customer use:
Enter below the Model No. and Serial No. which is located either on the rear, bottom or side of the cabinet. Retain this information for future reference.

Model No.: ____________

Serial No.: ____________

Purchase date: ____________

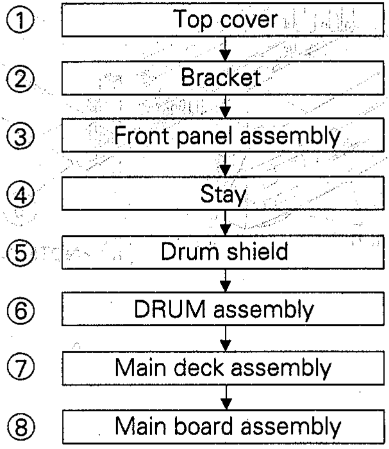
Name of dealer: ____________

MEMO

SECTION 1
DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART

This flowchart lists the disassembling steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend, route and dress the flat cables as they were originally laid.



1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	3(S1)	<NOTE 1>
②	BRACKET	D2	2(S2)	
③	FRONT PANEL ASSEMBLY	D3	7(L1)	<NOTE 2> <NOTE 3>
④	STAY	D4	(S3), (L2)	
⑤	DRUM SHIELD	D4	(S4), *CN1	
⑥	DRUM ASSEMBLY	D5	3(S5),WR1	<NOTE 4>
⑦	MAIN DECK ASSEMBLY	D6	2(S6),2(S7),WR2, 2(L3), *CN2001	<NOTE 5>
⑧	MAIN BOARD ASSEMBLY	D7	(S8), 6(L4)	

(1) (2) (3) (4) (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.

(2) Part name to be removed or installed.

(3) Fig.No. showing procedure or part location

(4) Indentification of part to be removed,unhooked,unlocked, released,unpluged,unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, * = Unhook,unlock, release,unplug or unsolder.

(5) Adjustment information for installation

1.3 DISASSEMBLY/ASSEMBLY METHOD

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	3(S1)	<NOTE 1>
②	BRACKET	D2	2(S2)	
③	FRONT PANEL ASSEMBLY	D3	7(L1)	<NOTE 2> <NOTE 3>
④	STAY	D4	(S3), (L2)	
⑤	DRUM SHIELD	D4	(S4), *CN1	
⑥	DRUM ASSEMBLY	D5	3(S5),WR1	<NOTE 4>
⑦	MAIN DECK ASSEMBLY	D6	2(S6),2(S7),WR2, 2(L3), *CN2001	<NOTE 5>
⑧	MAIN BOARD ASSEMBLY	D7	(S8), 6(L4)	

<NOTE1>
Do not place this equipment near to a high-temperature object, such as a soldering iron, as the Top cover is made of plastic and will easily be damaged.

<NOTE2>
When reattaching the Front panel assembly, make sure that the door opener ⓐ of the Cassette holder assembly is lowered in position prior to the reinstallation.

<NOTE3>
When reattaching the Front panel assembly, pay careful attention to the switch lever not to make it touch the REC switch knob ⓑ of the Main board assembly from the side. (If the REC switch knob of the Main board assembly is damaged, cassette loading is impossible.)

<NOTE4>
When plugging the connector in, check that the flat wire is inserted properly and fully.

<NOTE5>
- When removing the Main deck assembly only, unhook the two spacers connecting it with the Main board assembly with pliers from the back side of the Main board assembly first, and then remove the Main deck assembly.
- When reattaching the Main deck assembly to the Main board assembly, take care not to damage the sensors on the Main board (D3001: LED, Q3001: Start sensor, Q3002: End sensor).

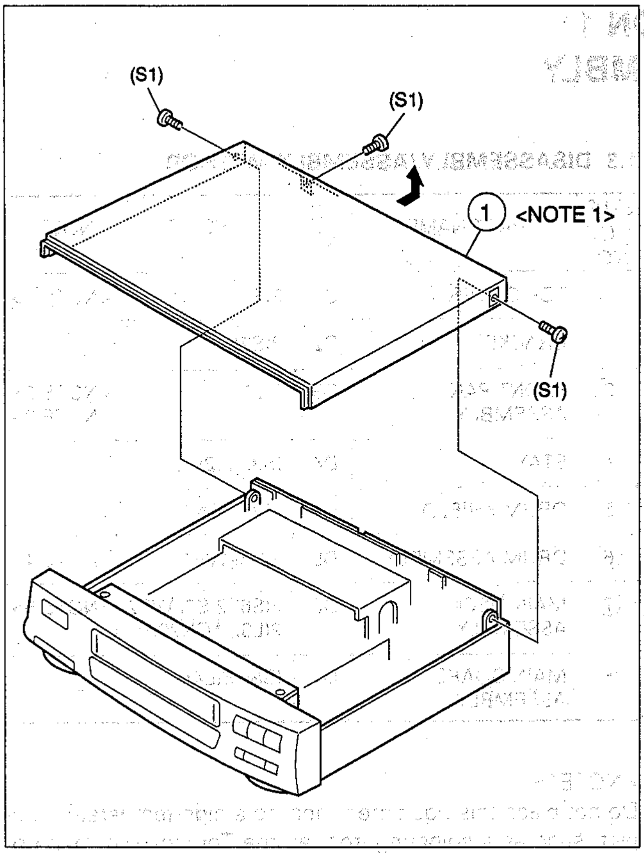


Fig. D1

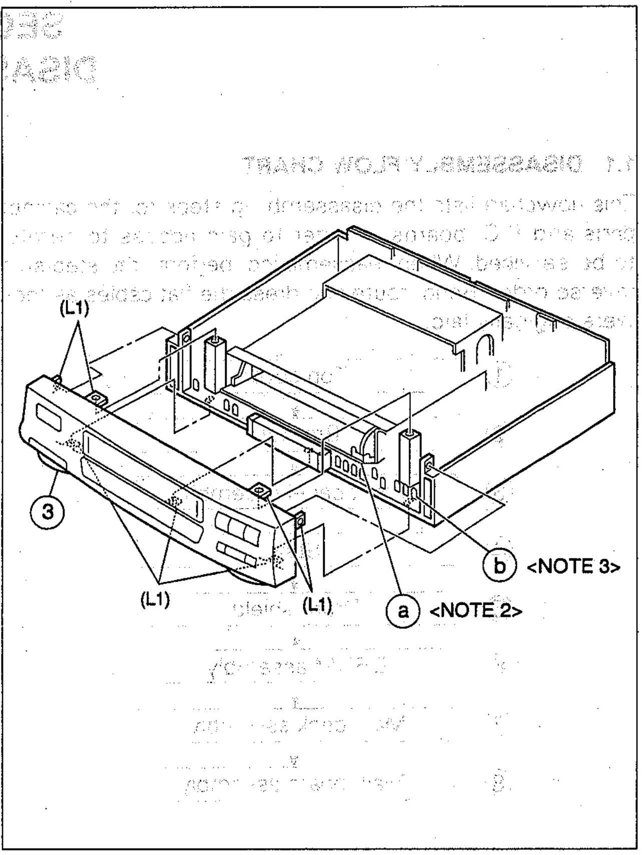


Fig. D3

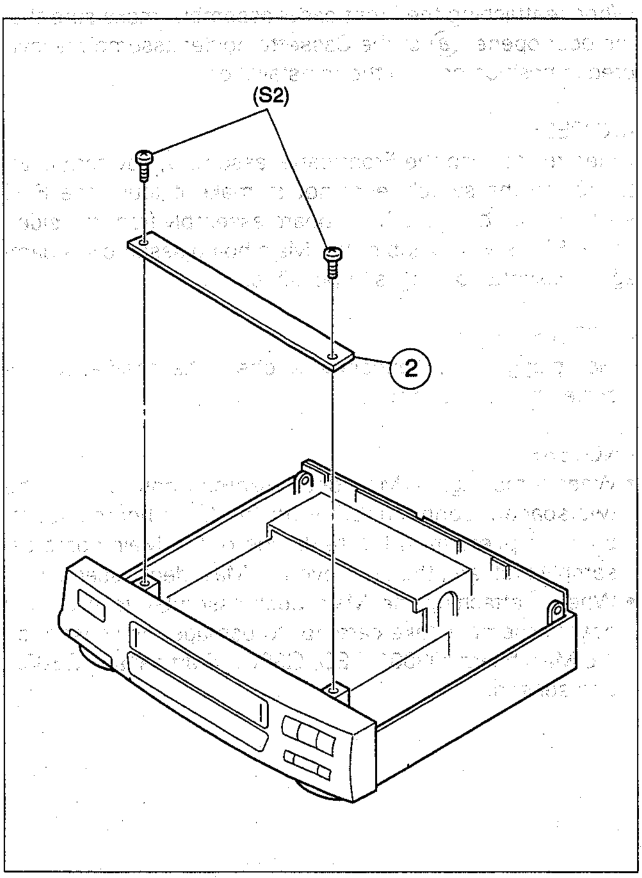


Fig. D2

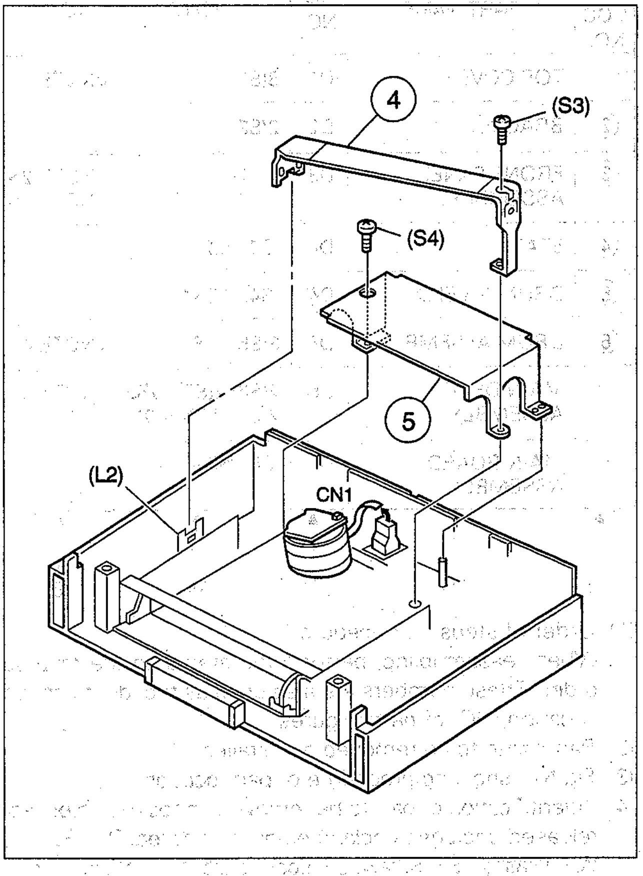

4
(S3)
(S4)
5
(L2)
CN1

Fig. D4

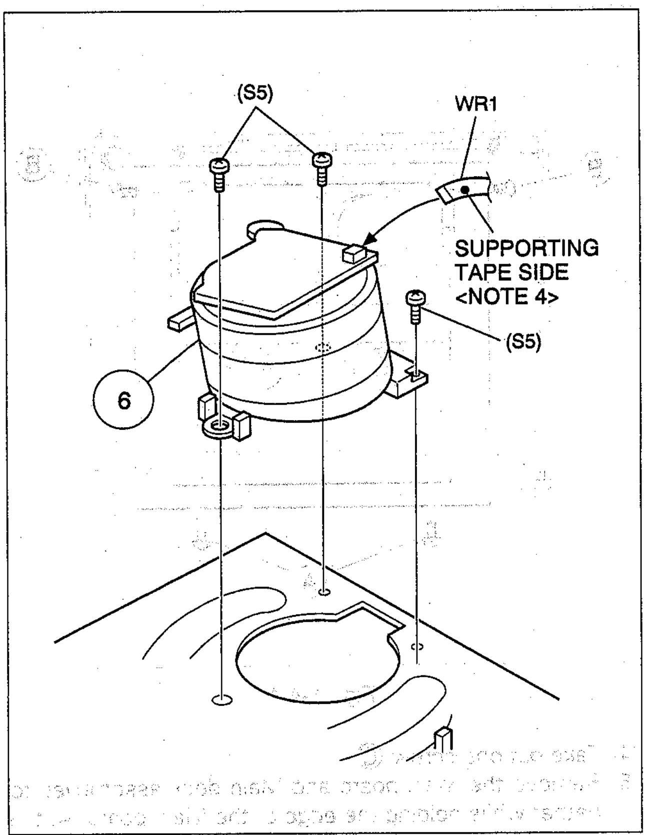

(S5)
WR1
SUPPORTING
TAPE SIDE
<NOTE 4>
(S5)
6

Fig. D5

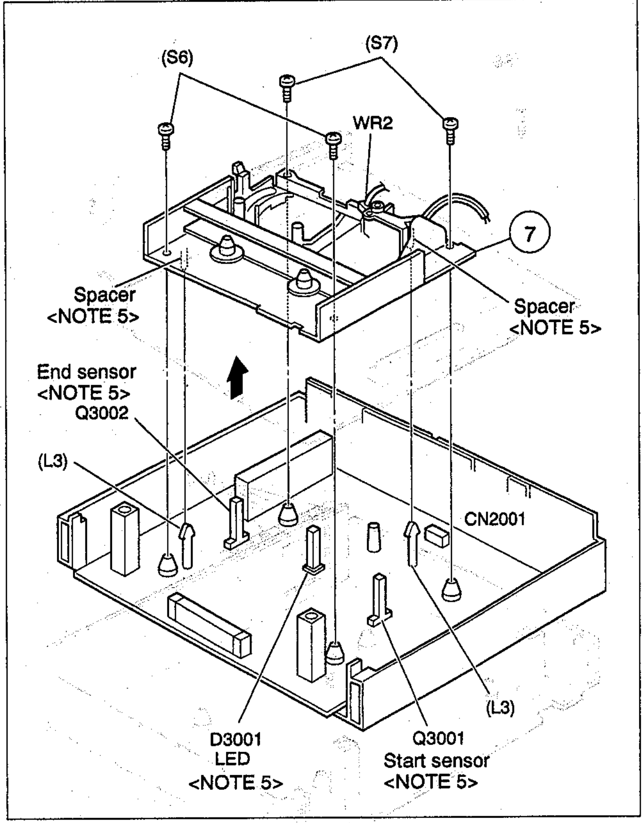

(S6)
(S7)
WR2
7
Spacer
<NOTE 5>
Spacer
<NOTE 5>
End sensor
<NOTE 5>
Q3002
(L3)
CN2001
(L3)
D3001
LED
<NOTE 5>
Q3001
Start sensor
<NOTE 5>

Fig. D6

Procedures for Lowering the Cassette holder assembly

As the mechanism of this unit is integrated with the Housing assembly, the holder must be lowered and the two bolts unscrewed when removing the Main deck assembly.

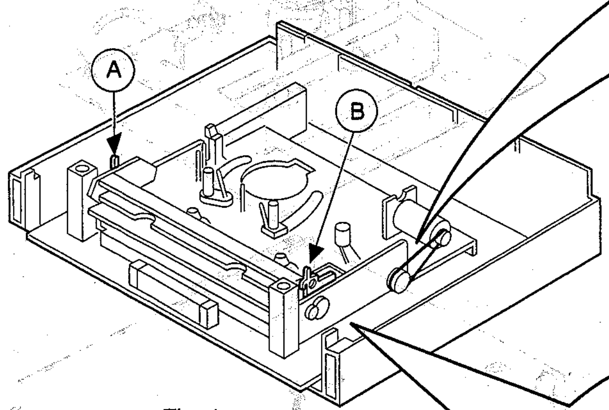


Fig. 1

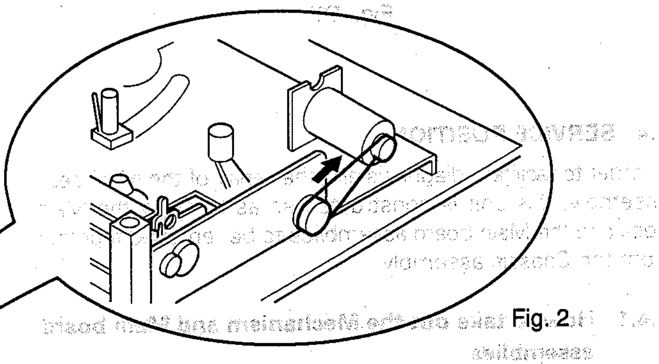


Fig. 2

Turn the loading motor pulley in the direction as indicated by Fig.2. As both Ⓐ and Ⓑ levers are lodged twice, push the levers in the direction as indicated by Fig.3 to release them. When pushing the levers, do it in the order of Ⓐ,Ⓑ,Ⓑ,Ⓐ. When the holder has been lowered, turn the pulley until the cassette holder is securely in place without allowing any up/down movement.

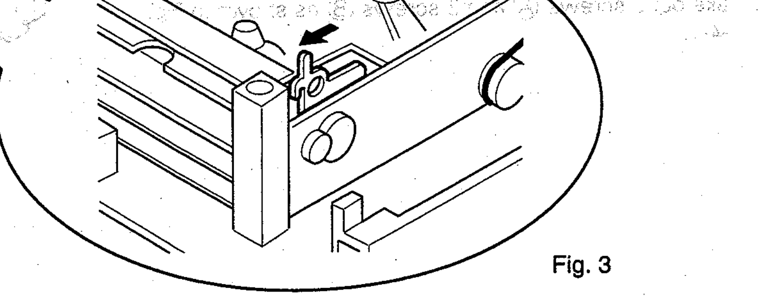


Fig. 3

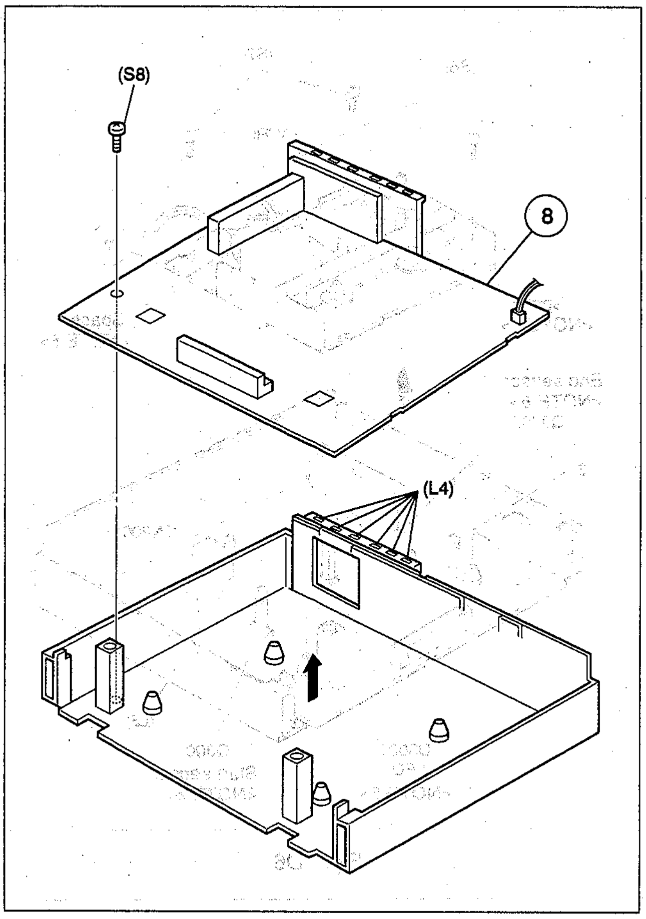


Fig. D7

1.4 SERVICE POSITION

In order to facilitate diagnosis and the repair of the Main deck assembly, this unit is constructed so as to allow the Main deck and the Main board assemblies to be removed together from the Chassis assembly.

1.4.1 How to take out the Mechanism and Main board assemblies

(1) Remove the Top cover, Bracket, Front panel assembly, Stay, and Drum shield. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD. Take care not to pull the drum wire (Fig.D4) from CN1).

(2) Lower the cassette holder, and make the preparations required in order to remove the bolts from the Main deck assembly (Refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD).

(3) Take out 2 screws Ⓐ and 2 screws Ⓑ as shown in Fig. 1-4-1.

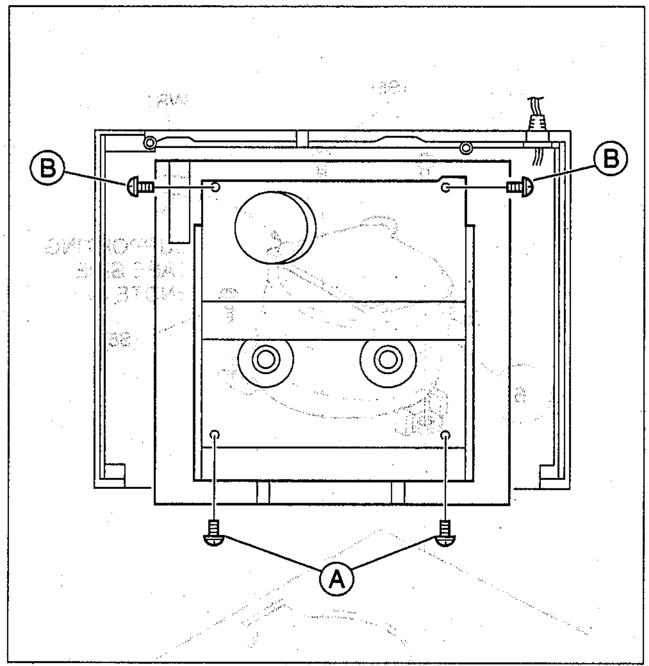


Fig. 1-4-1

(4) Take out one screw Ⓒ.

(5) Remove the Main board and Main deck assemblies together while holding the edge of the Main board. At this stage be careful of the power cord and prongs of the jacks on the back side (See Fig. 1-4-2).

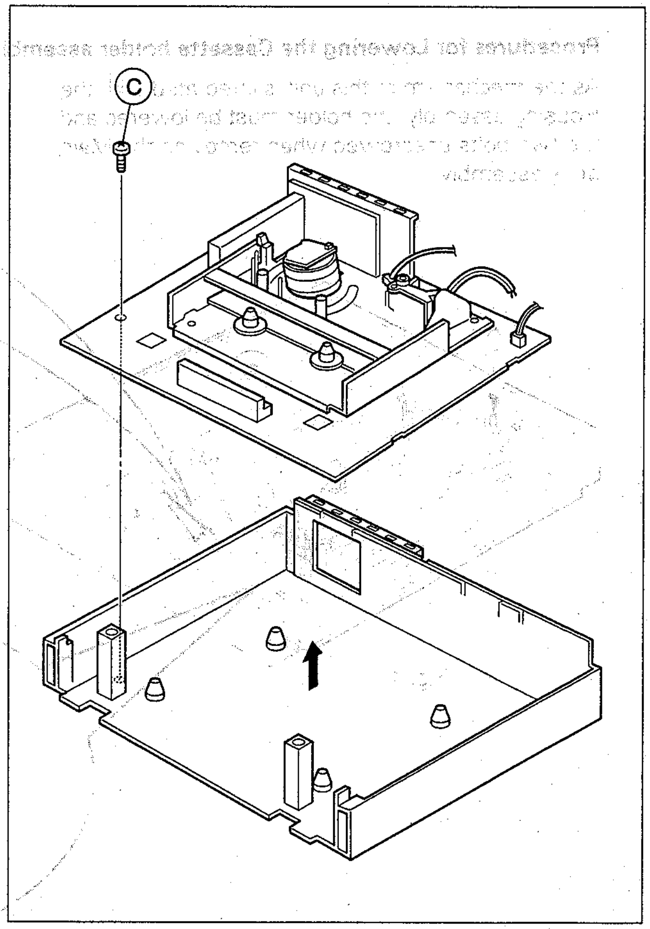


Fig. 1-4-2

(6) Hook the stay ④ removed at 1.4.1 (1) onto L2 and mount it on the main deck with one S3 (See Fig. 1-4-3).

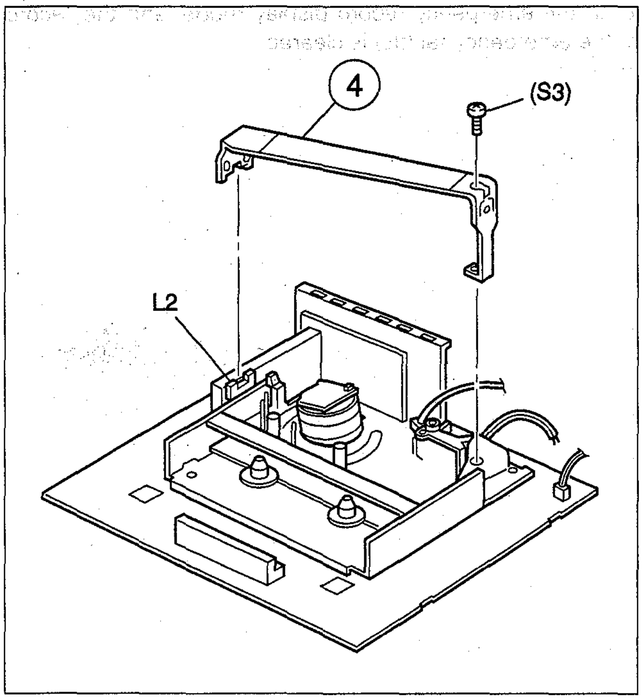


Fig. 1-4-3

(7) Connect the power cord to the wall socket, and lift the cassette holder.
(Before turning on the power make sure that there is nothing which may produce a short circuit, such as faulty soldering.)

(8) When performing a diagnosis or repair of the Main board assembly with a cassette tape in place, turn on the power, insert a cassette tape, and turn over the Main board and Main deck assemblies together.

Note: *When carrying out diagnosis and repair of the Main board assembly in the service position, be sure to ground both the Main board and the Main deck assemblies.*
If they are improperly grounded, there may be noise on the playback picture or the FDP counter display may move even when the mechanism is kept in an inoperative status.

1.5 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

1.5.1 How to set the "MECHANISM SERVICE MODE"

(1) Disconnect VCR from AC.
(2) Lower the cassette holder (Refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD).
(3) Connect TP GND AND TP7001 (TEST) on the Main board assembly with a jump wire.
(4) Connect VCR to AC.
(5) Press the POWER button.
(6) Select the desired operation modes with the operation buttons or remote controller.

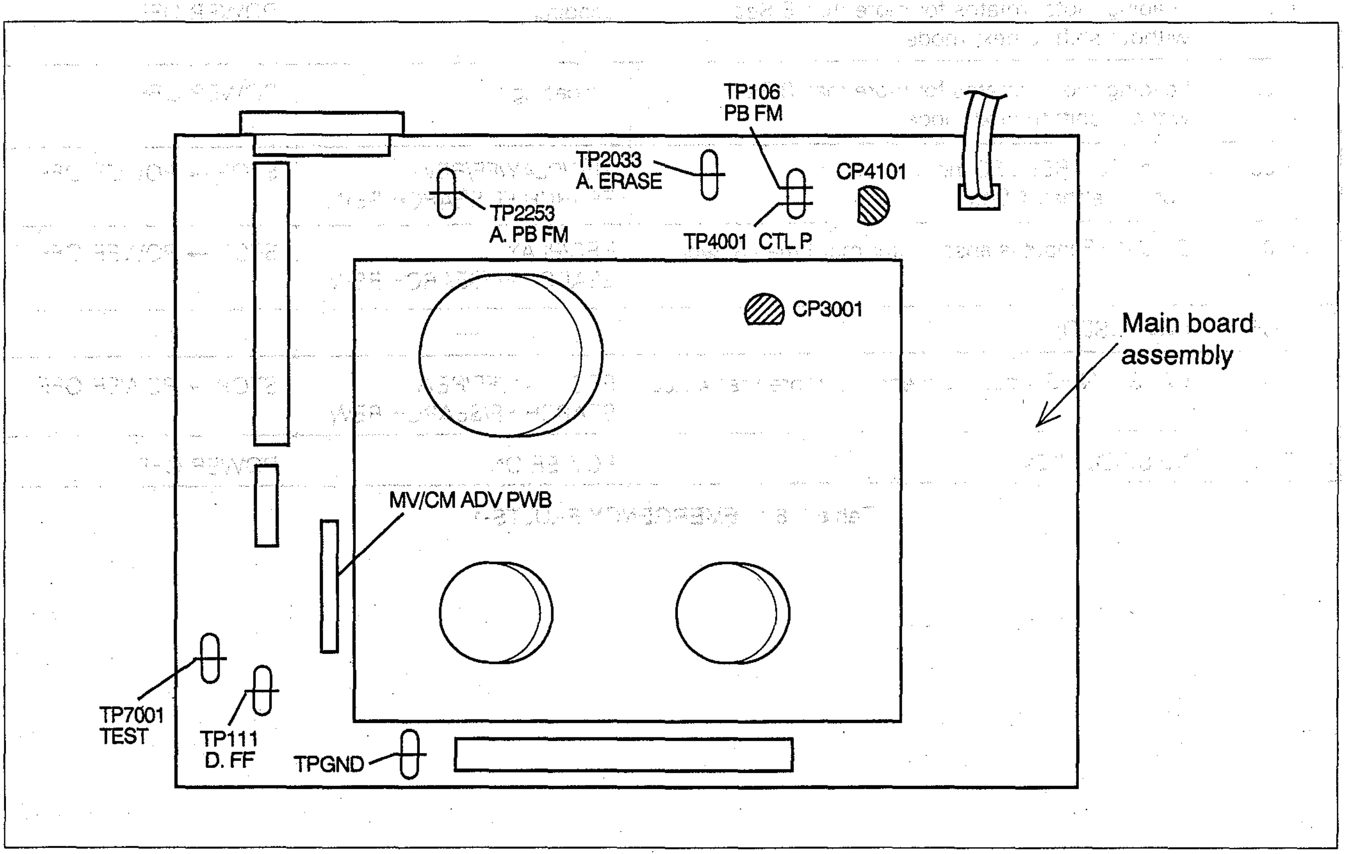


Fig. 1-5-1

1.6 EMERGENCY DISPLAY FUNCTION

This product has the function to store the last two previous emergency faults which can be displayed in the FDP when servicing.

1.6.1 How to display record of an emergency faults

Note: *Put the unit into A mode by using the VCR remote control. (When it is in B mode, the preset remote control codes are not accepted.)*

(1) Press "N" button of the presetting unit more than 2 seconds and the two previous emergency faults are shown in the LED or FDP.
(2) Press "N" button of the presetting unit again to return to the normal mode.

[Example] E : 01 : 03
- 03 — Emergency fault before last
- 01 — Emergency fault of the last time

[Example] E : — — : — — ← No record of emergency

1.6.3 How to clear emergency record

Press the COUNTER RESET button on the remote controller in the emergency record display mode, and the record of the emergency fault(s) is cleared.

1.6.2 Detail of emergency faults

EMG DATA	Symptom	Detect mode	Resulting mode
E — —	No EMERGENCY		
E 01	Loading motor rotates for more than 8 Sec without shift to next mode.	Loading	POWER OFF
E 02	Loading motor rotates for more than 8 Sec without shift to next mode.	Unloading	POWER OFF
E 03	TU or SUP REEL FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E 04	DRUM FF input is absent. (for more than 3 Sec)	REC/PLAY SEARCH FF/SEARCH REW	STOP → POWER OFF
E 05	(NOT USED)	—	—
E 06	CAPSTAN FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E 07	No SWD5V/12V	POWER ON	POWER OFF

Table 1-6-1 EMERGENCY FAULTS-1

1.7 SYSCON CIRCUIT

1.7.1 Syscon CPU pin function (IC3001) 1/2

PIN NO.	LABEL	IN/OUT	NOTE
1	AFT	IN	WHEN THE TUNER RECEIVE, SYNCHRONIZE WITH CENTER (ANALOG VALUE: 0 - 5 V)
2	START SENSOR	IN	LEADER TAPE DETECT (DETECT ON: L)
3	A.EVENT_DET	IN	BLANK AUDIO DETECT (DETECT ON: L) <MOVIE ADVANCE>
4	V.EVENT_DET	IN	BLANK VIDEO DETECT (DETECT ON: L) <MOVIE ADVANCE>
5	END SENSOR	IN	TRAILER TAPE DETECT (DETECT ON: L)
6	IND[L]	-	NC
7	IND[R]	-	NC
8	A.ENV/ND[L]	IN	AUDIO PB FM ENV. INPUT/NON HiFi MODE: L
9	VIDEO ENV.	IN	VIDEO PB FM INPUT
10	PROTECT	IN	SWD 5V/12V DETECT
11	REC_LEVEL_V	-	NC
12	V. PULSE	OUT	V. PULSE ADDITION TIMING CONTROL
13	REC ST (H)	OUT	NORMAL AUDIO REC START: H
14	RC IN	IN	REMOTE CONTROL DATA INPUT
15	CTL_GAIN	OUT	CONTROL AMP OUT FREQUENCY RESPONSE SWITCHING
16	NC	-	NC
17	LOCK[L]	IN	TUNING LOCK DETECT: L
18	D. FF	OUT	"VIDEO PB FM (CH-1, CH-2) SWITCHING PULSE"
19	A. FF	OUT	AUDIO FF OUTPUT
20	NC	-	NC
21	HSW	IN	HEAD SEL
22	ADLE	-	NC
23	BS_P.CTL	-	NC
24	BS_ANT_ON[L]	-	NC
25	BIT_IN/PAL_DET	-	NC
26	LMC1	OUT	LOADING MOTOR DRIVE (1)
27	LMC2	OUT	LOADING MOTOR DRIVE (2)
28	LMC3	OUT	LOADING MOTOR DRIVE (3)
29	CASS SW	-	NC
30	REC SAFETY	IN	REC SAFETY SWITCH DETECT (SW ON: L)
31	LSC	IN	MECHANISM MODE DETECT (C)
32	LSB	IN	MECHANISM MODE DETECT (B)
33	LSA	IN	MECHANISM MODE DETECT (A)
34	NUB	-	NC
35	NUA	-	NC
36	CLK_SEL	-	NC
37	VCC	-	SYSTEM POWER
38	X IN	-	TIMER CLOCK
39	X OUT	-	TIMER CLOCK
40	VSS	-	GND
41	XC IN	-	SYSTEM CLOCK
42	XC OUT	-	SYSTEM CLOCK
43	RESET	-	RESET AT CONNECT VCR TO AC
44	P CTL (H)	OUT	POWER ON/OFF CONTROL (POWER ON: H)
45	TU CLK	OUT	SERIAL DATA SHIFT CLOCK OUTPUT
46	TU CE	OUT	TUNER UNIT CHIP ENABLE
47	TU DATA	OUT	TUNING CONTROL SERIAL DATA OUTPUT
48	TU_MUTE[H]	OUT	TUNER MUTE CONTROL A/V (MUTE ON: H)
49	NC	-	NC
50	COMPU_OUT	OUT	A/V COMPULINK OUTPUT

Table 1-7-1 SYSCON CPU pin function(1/2)

1.7.2 Syscon CPU pin function (IC3001) 2/2

PIN NO.	LABEL	IN/OUT	NOTE
51	CS2/CONVERT[L]/BIL_SELECT	OUT	ON SCREEN WITH EDS CHIP SELECT/COLOR MODE CONV. ON:L
52	P MUTE (L)	OUT	PICTURE MUTE CONTROL (MUTE ON: L)
53	POWER_DET	IN	AC POWER SOURCE DETECT
54	EE[L]	-	NC
55	A.WIDE	-	NC
56	AP_ON[L]/IP_ON[H]	-	NC
57	SYNC_DET[H]	IN	NON SYNC INPUT TO ON SCREEN: H
58	A.EFECT	-	NC
59	FULL_E_ON[H]	-	NC
60	N.REC[H]	OUT	NORMAL AUDIO REC MODE CONTROL (REC : H)
61	CONV.CTL[H]	OUT	R/F CONVERTER ON/OFF (ON: H, OFF: L)
62	H.REC_ST[L]	OUT	HiFi AUDIO REC MODE CONTROL (REC:L)
63	H.REC[H]	OUT	HiFi AUDIO REC MODE CONTROL (REC:H)
64	OSD CS	OUT	ON SCREEN IC CHIP ENABLE
65	SSB DATA	-	NC
66	STB	OUT	STROBE (FOR FDP DRIVER)
67	SSB CLK	-	NC
68	DATA O	OUT	SERIAL DATA OUTPUT (TO OSD IC AND FDP IC)
69	DATA I	IN	SERIAL DATA INPUT (FROM FDP IC)
70	S CLK	-	NC
71	TEST/I2C CLK	OUT	SERIAL DATA TRANSFER CLOCK TO EEPROM IC
72	I2C DATA	IN	SERIAL DATA INPUT FROM EEPROM IC
73	C.BOX_OUT	OUT	BIAS OUTPUT FOR C.BOX
74	A.MUTE[H]	OUT	AUDIO MUTE CONTROL (MUTE ON : H)
75	EDS[H]/JUST_CLK	OUT/IN	EDS ON: H/INPUT FOR TIME SETTING
76	CAP REV (L)	OUT	CAPSTAN MOTOR CONTROL (FWD: H/REV: L)
77	CAP CTL V	OUT	CAPSTAN MOTOR CONTROL
78	DRUM CTL V	OUT	DRUM MOTOR CONTROL
79	SP FG	IN	SUPPLY REEL ROTATION DET/TAPE REMAIN
80	TU FG	IN	TAKE-UP REEL ROTATION DET/TAPE REMAIN
81	R.PAUSE/COMPU_IN	IN	REMOTE PAUSE INPUT / A/V COMPULINK INPUT
82	EV_MASK	IN	EVENT LATCH PULSE <MOVIE ADVANCE>
83	C	-	NC
84	C. SYNC	IN	COMPOSITE SYNC
85	C. FG IN	IN	CAPSTAN FG PULSE INPUT
86	D. PG IN	IN	DRUM PICKUP PULSE INPUT (SWITCHING PULSE)
87	D. FG IN	IN	DRUM FG PULSE INPUT
88	AMP VSS	-	GND
89	AMP V REF OUT	OUT	AMP CIRCUIT REFERENCE VOLTAGE OUTPUT
90	AMP V REF IN	-	NC
91	CTL-	IN/OUT	CTL (-) SIGNAL
92	CTL+	IN/OUT	CTL (+) SIGNAL
93	CTL SW OUT	OUT	CTL PULSE OUTPUT
94	CTL AMP IN	IN	CTL PULSE INPUT
95	AMP C	IN	CAPACITOR CONNECT TERMIAL FOR CTL AMP CIRCUIT
96	CTL VSS	-	CTL AMP CIRCUIT REFERENCE Vss
97	CTL AMP OUT	OUT	CTL PULSE OUTPUT
98	AMP VCC	-	CTL AMP POWER
99	AVCC	-	SYSTEM POWER
100	TU_LED	-	NC

Table 1-7-2 SYSCON CPU pin function(2/2)

SECTION 2
MECHANISM ADJUSTMENT

2.1 BEFORE STARTING REPAIR AND ADJUSTMENT

2.1.1 Precautions

(1) Unplug the power cable of the main unit before using your soldering iron.
(2) Take care not to cause any damage to the conductor wires when plugging and unplugging the connectors.
(3) Do not randomly handle the parts without identifying where the trouble is.
(4) Exercise enough care not to hurt yourself, especially your finger nails, during the repair work.
(5) When installing the front panel assembly, be sure to hook the lug on the back side of cassette door to the door opener of the cassette holder. If this operation is neglected it will not be possible to remove the cassette when ejecting because the housing door cannot be opened.

2.1.2 Checking for Proper Mechanical Operations

Enter the mechanism service mode when you want to operate the mechanism when no cassette is loaded. (See 1.5 MECHANISM SERVICE MODE)

2.1.3 Manually Removing the Cassette Tape

1. In case of electrical failures

If you cannot remove the cassette tape which is loaded because of any electrical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, bracket, front panel assembly, stay and Drum shield. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD)
(2) Unload the cassette by manually turning the unloading motor of the main deck assembly toward the front. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.2-1-1)
(3) Bring the pole base assembly (on the supply or take-up side) to a pause when it reaches the position where it is hidden behind the cassette tape.
(4) Move the top plate toward the drum while holding down the lug Ⓐ of the bracket retaining the top plate. Likewise hold part Ⓑ down and remove the top plate.
The spring plate Ⓒ is then brought under the cassette lid. Then remove the top plate by pressing the whole cassette tape down. (Note 1) (See Fig.2-1-2).
(5) Remove the cassette tape by holding both the slackened tape and the cassette lid.
(6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

Note: *The spring plate of the top plate is sharp-edged. Take care not to hurt yourself.*

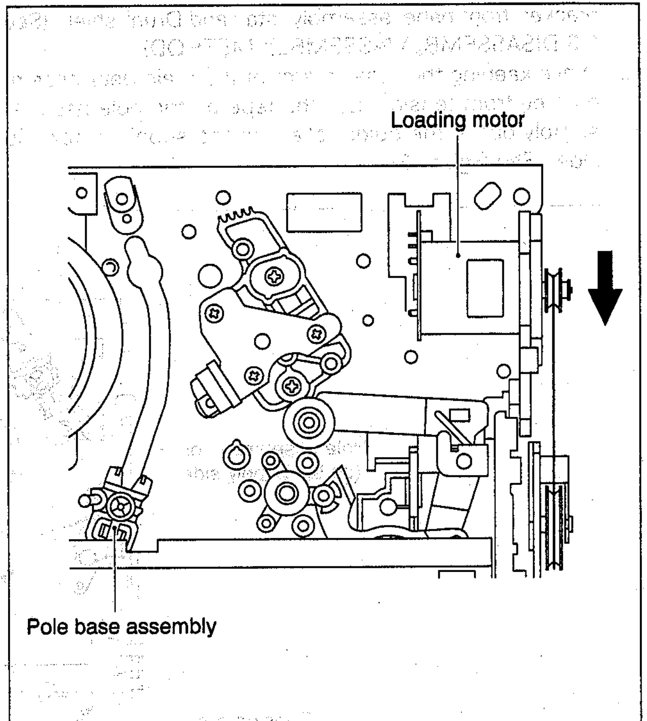


Fig. 2-1-1

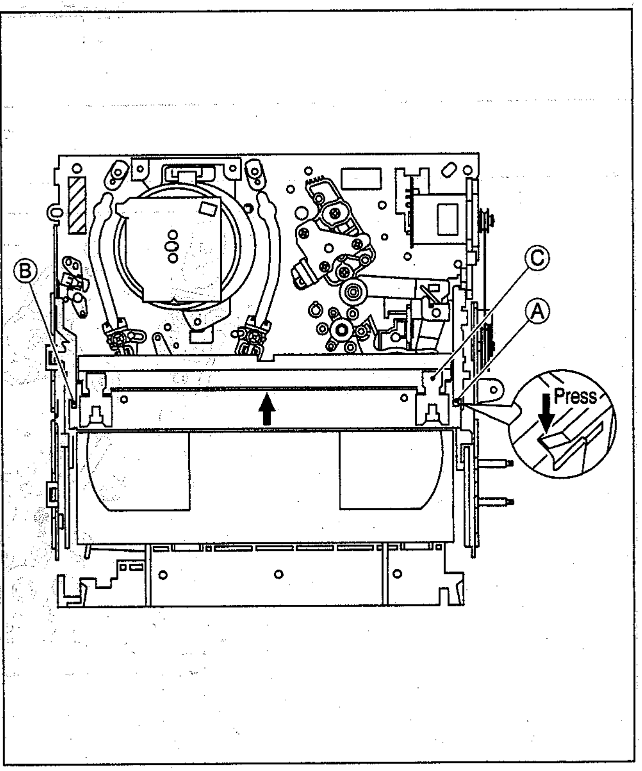


Fig. 2-1-2

2. In case of mechanical failure

If you cannot remove the cassette tape which is loaded because of any mechanical failure, manually remove it by taking the following steps.

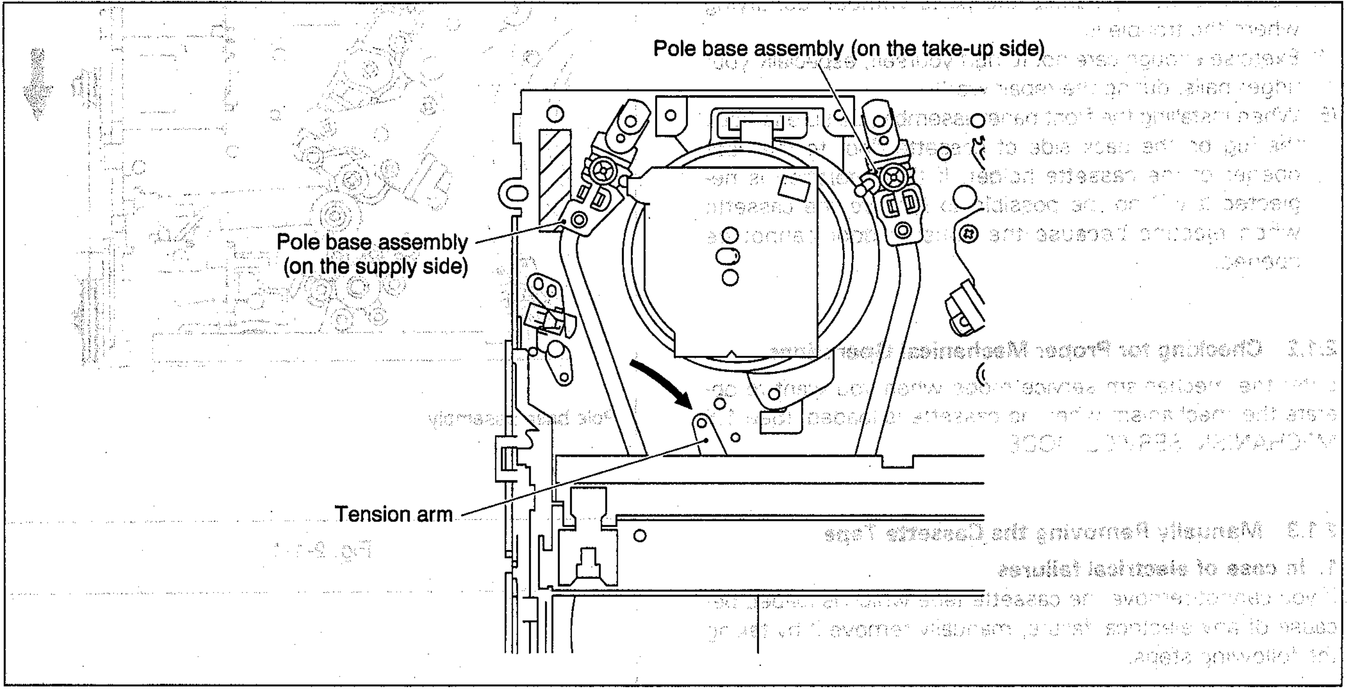
(1) Unplug the power cable and remove the top cover, bracket, front panel assembly, stay and Drum shield (See 1.3 DISASSEMBLY/ASSEMBLY METHOD).

(2) While keeping the tension arm of the main deck assembly free from tension, pull the tape on the pole base assembly out of the guide roller (on the supply or take-up side) (See Fig.2-1-3).

(3) Remove the top plate as done in Step (4) of "1 In case of electrical failures" and remove the guide pole cap at the same time. (See Fig.2-1-4).

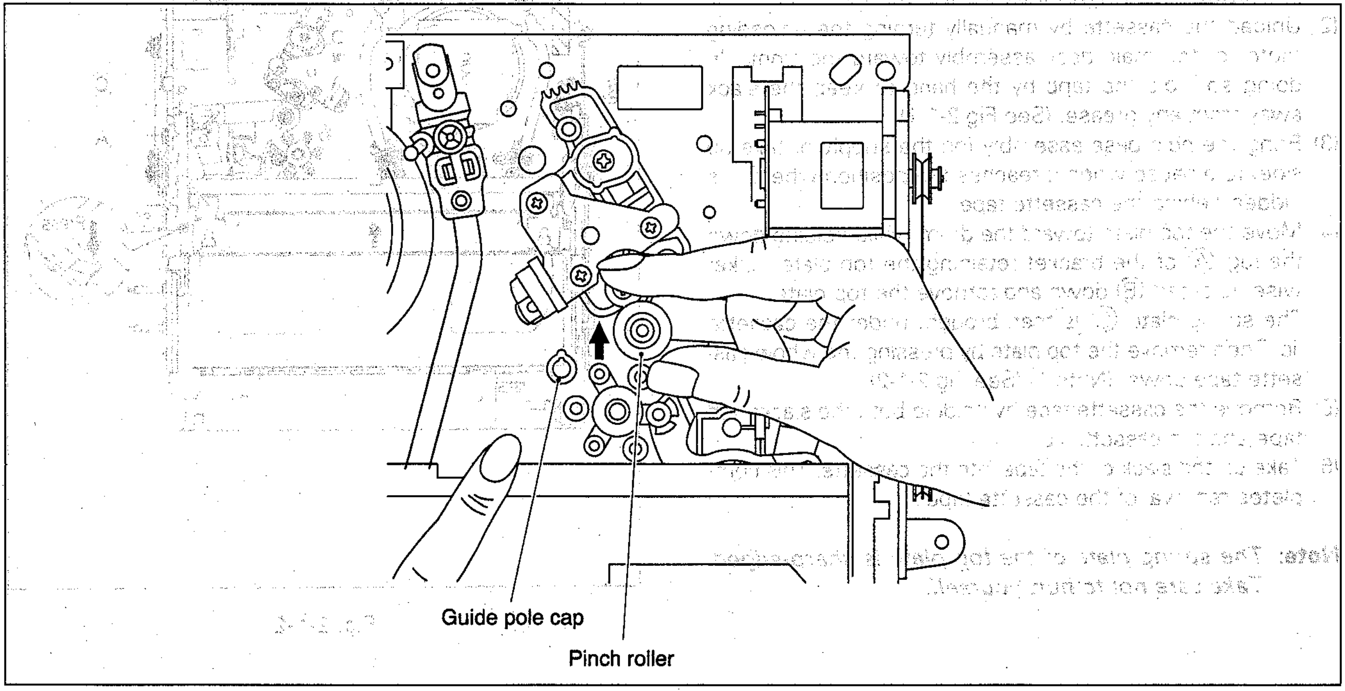
(4) While lifting the cassette tape lid, hold the cassette tape case and pinch roller by the fingers and move them toward the loading motor to relieve pressure on the tape. Then remove the tape while taking the cassette case out of the cassette holder. (See Fig.2-1-4).

(5) Re-place the guide pole cap and take up the slack of the tape into the cassette.



Pole base assembly (on the take-up side)
Pole base assembly (on the supply side)
Tension arm

Fig. 2-1-3



Guide pole cap
Pinch roller

Fig. 2-1-4

2.1.4 Jigs and Tools Required for Adjustment

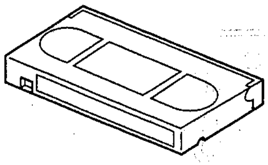
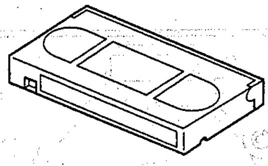
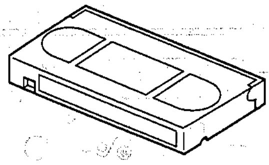
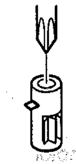
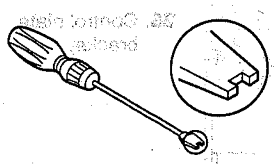
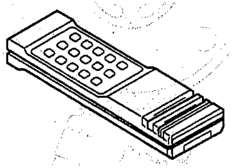
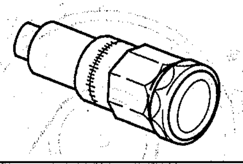
Alignment tape (SP) MHP	Alignment tape (EP) MHP-L	Back tension cassette gauge PUJ48076-2	A/C head position bit PTU94010
			
Roller driver PTU94002	Presetting unit PTU94008	Torque gauge PUJ48075-2	
			

Table 2-1-1 Jigs and tools required for adjustment

2.1.5 Maintenance and Inspection

1. Location of major mechanical parts

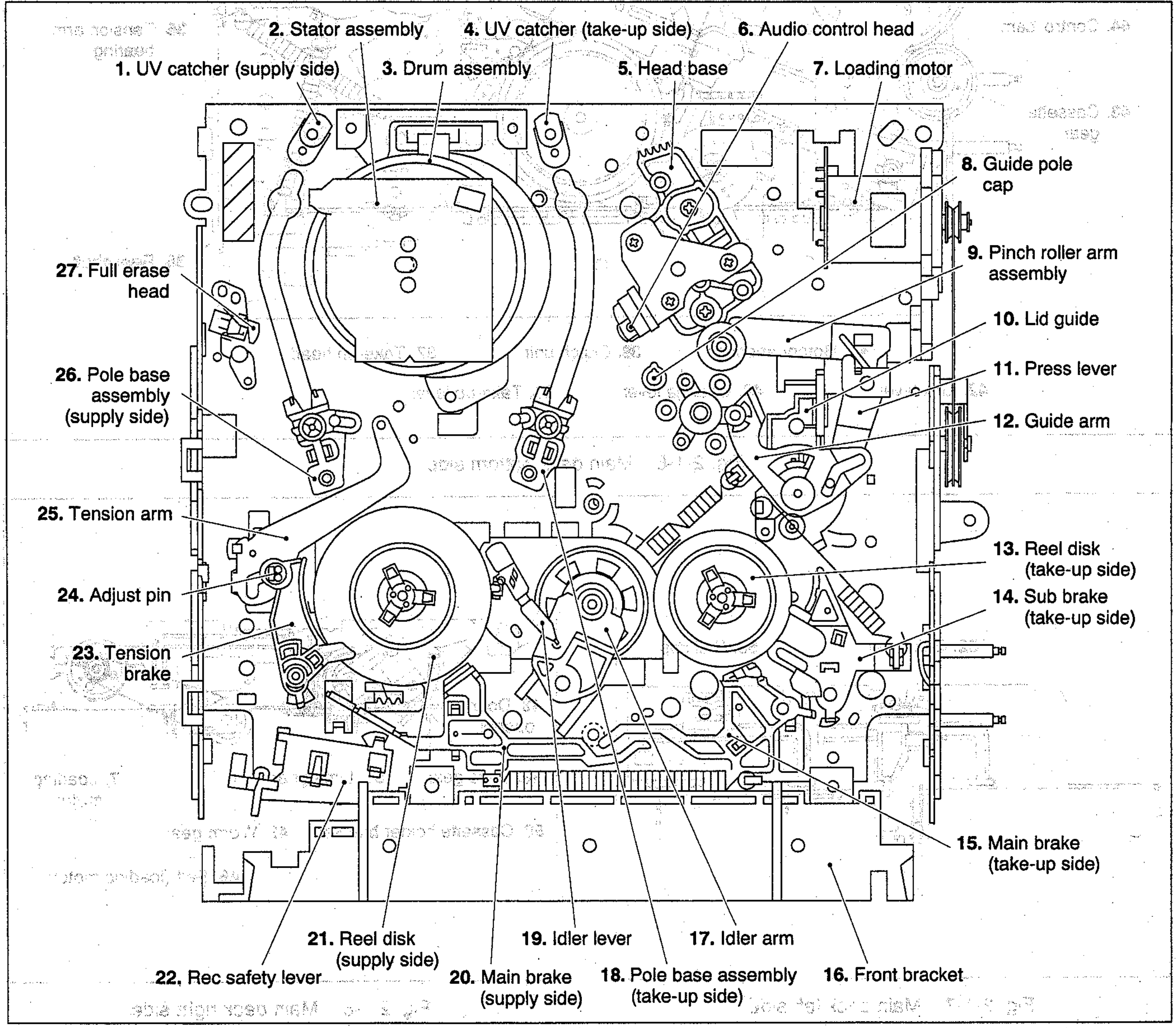

2. Stator assembly
4. UV catcher (take-up side)
6. Audio control head
1. UV catcher (supply side)
3. Drum assembly
5. Head base
7. Loading motor
8. Guide pole cap
9. Pinch roller arm assembly
10. Lid guide
11. Press lever
12. Guide arm
13. Reel disk (take-up side)
14. Sub brake (take-up side)
15. Main brake (take-up side)
27. Full erase head
26. Pole base assembly (supply side)
25. Tension arm
24. Adjust pin
23. Tension brake
21. Reel disk (supply side)
19. Idler lever
17. Idler arm
22. Rec safety lever
20. Main brake (supply side)
18. Pole base assembly (take-up side)
16. Front bracket

Fig. 2-1-5 Main deck top side

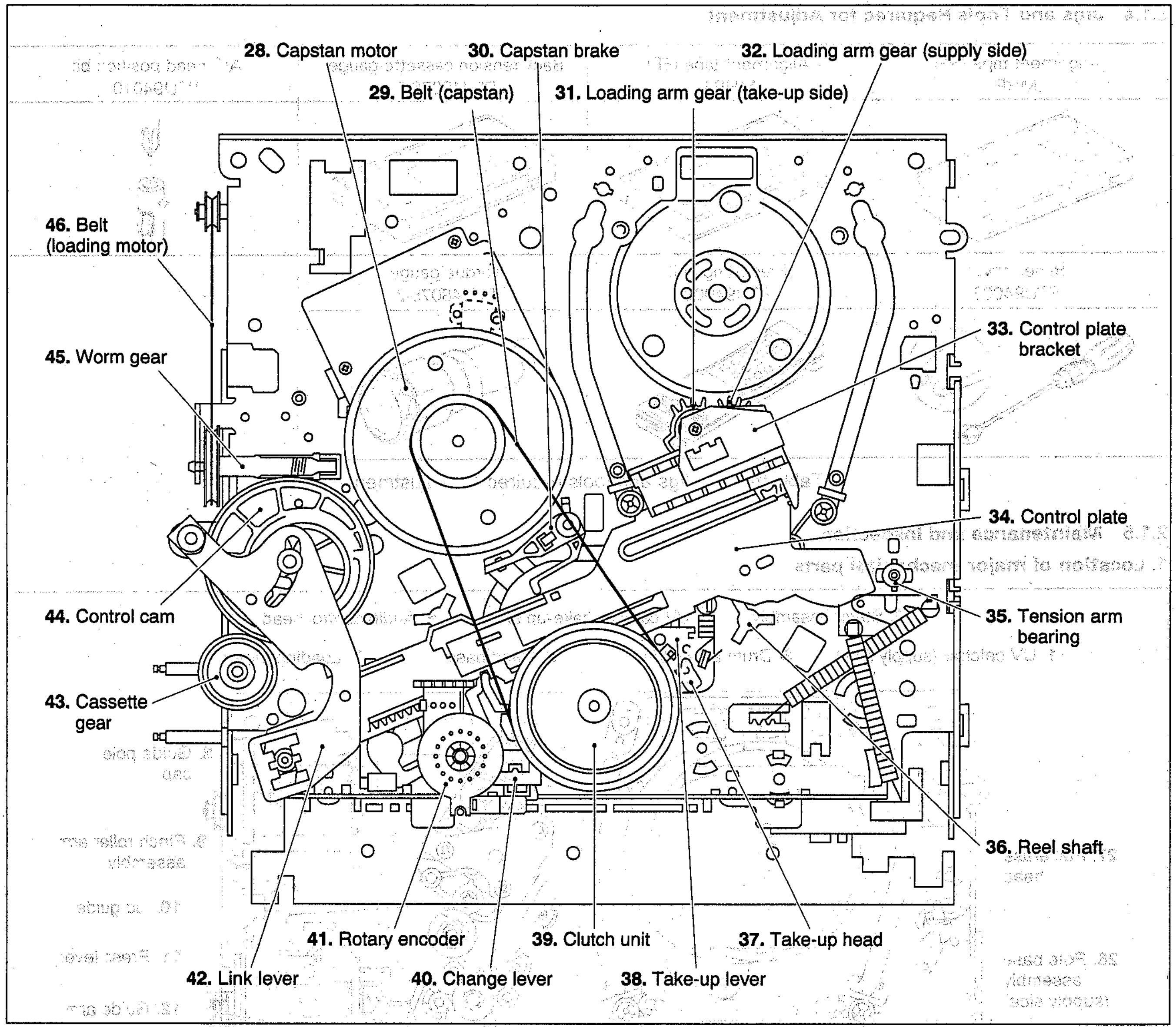

28. Capstan motor
30. Capstan brake
32. Loading arm gear (supply side)
29. Belt (capstan)
31. Loading arm gear (take-up side)
46. Belt (loading motor)
45. Worm gear
33. Control plate bracket
34. Control plate
44. Control cam
35. Tension arm bearing
43. Cassette gear
36. Reel shaft
41. Rotary encoder
39. Clutch unit
37. Take-up head
42. Link lever
40. Change lever
38. Take-up lever

Fig. 2-1-6 Main deck bottom side

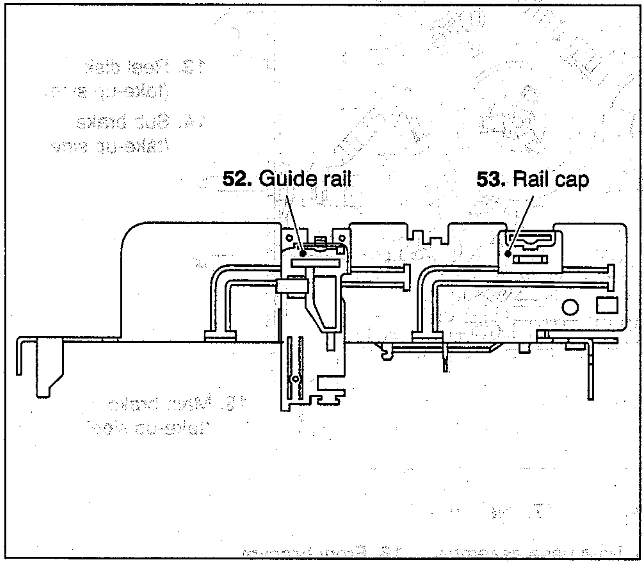

52. Guide rail
53. Rail cap

Fig. 2-1-7 Main deck left side

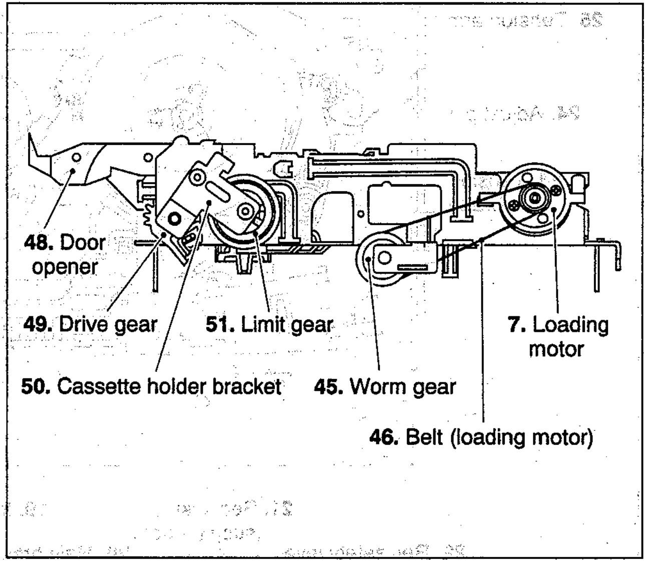

48. Door opener
49. Drive gear
51. Limit gear
7. Loading motor
50. Cassette holder bracket
45. Worm gear
46. Belt (loading motor)

Fig. 2-1-8 Main deck right side

Note: *Numerals at the start of the parts names are identical with those of the location diagrams of the major mechanical parts, 1 - 18 of which denote the order of removal. Of the alphabets T and B next to the parts names, T denotes removal from the main deck top side, B from the bottom side and T/B from both sides.*

			1,4	12	53	46	9	52	11	50	–	–	–	49	32	–	–	38	25	23	31	16	21	42	41	29	39	40	33	34	14	19
	Replacement parts names Removable parts names		UV catcher	Guide arm assembly	Rail cap	Belt (loading motor)	Pinch roller arm assembly	Guide rail	Press lever assembly	Cassette Holder bracket	Opener guide	Relay gear	Cassette holder assembly	Drive gear	Loading arm gear (supply side)	Drive arm assembly	Tension spring	Take-up lever	Tension arm assembly	Tension brake assembly	Loading arm gear (take-up side)	Front bracket	Reel base (supply side)	Link lever	Rotary encoder	Belt (capstan motor)	Clutch unit	Change lever	Control plate bracket	Control plate	Sub brake	Idler lever
17	Idler arm	T			1			2		3	4	5	6	7		8				9			10	11	12	13	14	15	16	17		18
15	Main brake (take-up side)	T/B			1			2		3	4	5	6	7		8						9		10	11	12	13	14	15	16	17	
13	Reel disk (take-up side)	T			1			2		3	4	5	6	7		8						9		10	11	12	13	14	15	16	17	
19	Idler lever	T/B			1			2		3	4	5	6	7		8				9			10	11	12	13	14	15	16	17		
–	Rotary encoder guide	T/B			1			2		3	4	5	6	7		8						9		10	11	12	13	14	15	16	17	
14	Sub brake (take-up side)	T/B			1			2		3	4	5	6	7		8						9		10	11	12	13	14	15	16		
–	Loading arm gear shaft	B													8						9			1	2	3	4	5	6	7		
35	Tension arm bearing	T			1			2		3	4	5	6				8		9	7												
–	Control plate guide	T/B																8						1	2	3	4	5	6	7		
37	Take-up head	B																8						1	2	3	4	5	6	7		
31	Loading arm gear (take-up side)	B													8									1	2	3	4	5	6	7		
25	Tension arm assembly	T/B			1			2		3	4	5	6				8			7												
20	Main brake (supply side)	T/B			1			2		3	4	5	6	7		8																
38	Take-up lever	T/B																						1	2	3	4	5	6	7		
32	Loading arm gear (supply side)	B																						1	2	3	4	5	6	7		
21	Reel disk (supply side)	T			1			2		3	4	5	6	7																		
–	Drive arm assembly	T			1			2		3	4	5	6	7																		
30	Capstan brake	T/B																						1	2	3	4	5	6	7		
34	Control plate	B																						1	2	3	4	5	6			
23	Tension brake assembly	T/B			1			2		3	4	5	6																			
–	Cassette holder assembly	T			1			2		3	4	5																				
–	Direct gear	B																							1	2	3	4				
10	Lid guide	T		1			2		3																							
40	Change lever	B																							1	2	3					
49	Drive gear	T								1	2	3																				
11	Press lever assembly	T		1			2																									
–	Relay gear	T								1	2																					
51	Limit gear assembly	T								1	2																					
26	Pole base assembly (supply side)	T/B	1																													
18	Pole base assembly (take-up side)	T/B	1																													
–	Tension spring (Main brake)	T																				1										
22	Rec safety lever	T/B																				1										
28	Capstan motor	T/B																								1						
45	Worm gear	B				1																										
44	Control cam	B																						1								
43	Cassette gear	B																						1								
39	Clutch unit	B																								1						
9	Pinch roller arm assembly	T		1																												
–	Opener guide	T								1																						
8	Guide pole cap	T																														
1,4	UV catcher	T																														
42	Link lever	B																														
41	Rotary encoder	B																														
12	Guide arm assembly	T																														
50	Cassette holder bracket	T																														
52	Guide rail	T																														
53	Rail cap	T																														
7	Loading motor assembly	T																														
5	A/C head assembly	T																														

2. Cleaning

Regular cleaning of the transport system parts is desirable but practically impossible. So make it a rule to carry out cleaning of the tape transport system whenever the machine is serviced.

When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

(1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth or Kimu-wipe with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.

Note: *Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.*

(2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.

(3) After cleaning, make sure that the cleaned parts are completely dry before using the video tape.

3. Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

(1) See the mechanism assembly and disassembly diagrams (M4) for the lubricating or greasing spots. See Table 2-1-2 for the types of oil or grease to be used.

Type	Name	Serial No.	Symbols on the disassembly diagrams
Grease	Maltemp SH-P	KYODO-SH-P	AA
Oil	Cosmohydro HV56	COSMO-HV56	BB

Table 2-1-2 Grease and oil used for the unit

4. Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning,lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions.However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time,even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assembly	★○	○
	A/C head	★○	★○
	Lower drum assembly	★	★○
	Pinch roller arm assembly	★	★
	Full erase head	★	★
	Tension arm assembly	★	★
	Capstan motor (Shaft)	★	★
	Guide arm assembly	★	★
Drive	Capstan motor		○
	Capstan brake		○
	Main brake		○
	Belt (Capstan)	○	○
	Belt (Loading motor)		○
	Loading motor		○
	Clutch unit		○
	Worm gear assembly		○
	Control plate		○
Other	Brush assembly	★○	★○
	Tension brake	○	○
	Rotary encoder		○

★: Cleaning

○: Inspection or Replacement if necessary

Table 2-1-3

2.2 REPLACEMENT OF MAJOR PARTS

2.2.1 Before Starting Disassembling

This unit is provided with a mechanism assembly mode. It is therefore necessary to enter this mode for assembling and disassembling procedures.
This mode is usually not in use, manually set it when it is required.

2.2.2 How to Set the Mechanism Assembling Mode

Remove the main deck assembly and place it bottom side up. (See SECTION 1 DISASSEMBLY). Turn the worm gear toward the front so that the register hole of the control cam is brought into alignment with the hole at the main deck assembly chassis. This position renders the mechanism assembling mode operational. Make sure that the control plate is located in alignment with the mark E. (See Fig.2-2-1)

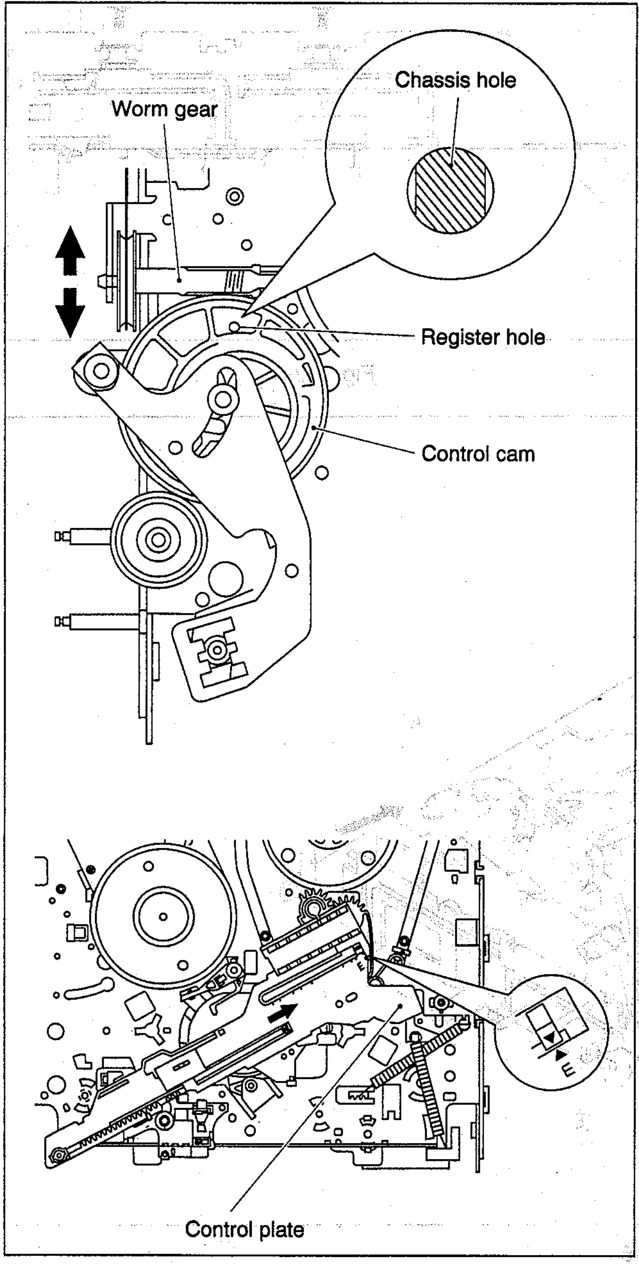

Chassis hole
Worm gear
Register hole
Control cam
E
Control plate

Fig. 2-2-1

2.2.3 Cassette Holder Assembly

1. How to remove

(1) Remove the guide rail and rail cap. (See Fig.2-2-2).
(2 lugs on the guide rail and one lug on the rail cap)

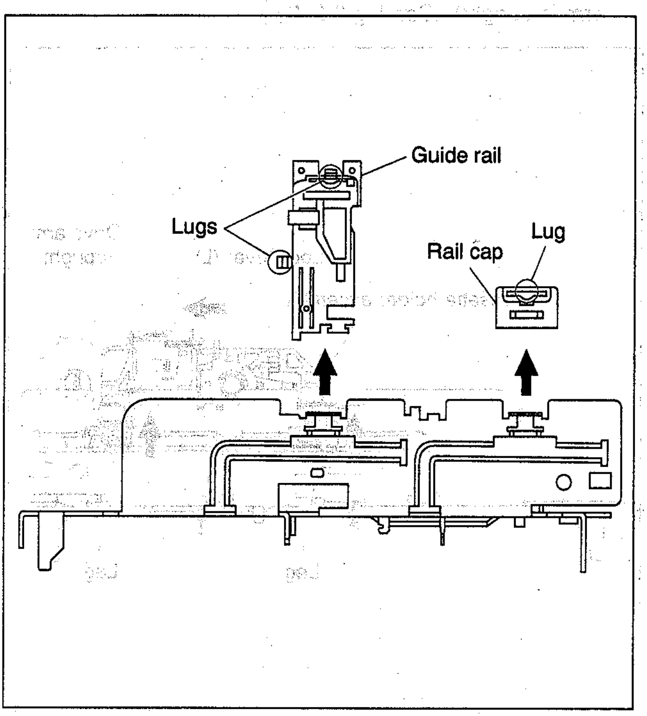

Guide rail
Lugs
Lug
Rail cap

Fig. 2-2-2

(2) Remove the two slit washers and remove the cassette holder bracket. (See Fig.2-2-3)
(3) Remove the opener guide, elay gear and limit gear. (See Fig.2-2-3)

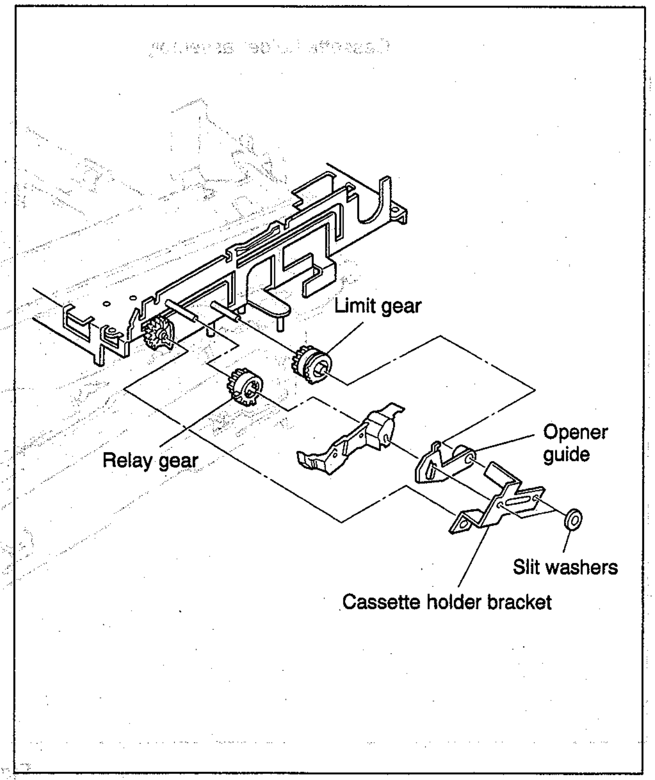

Limit gear
Relay gear
Opener guide
Slit washers
Cassette holder bracket

Fig. 2-2-3

(4) While swinging the lock levers (R) and (L) of the cassette holder assembly toward the front, slide the cassette holder assembly until its legs come to where the guide rail and the rail cap have been removed (so that the drive arm is upright). (See Fig.2-2-4)

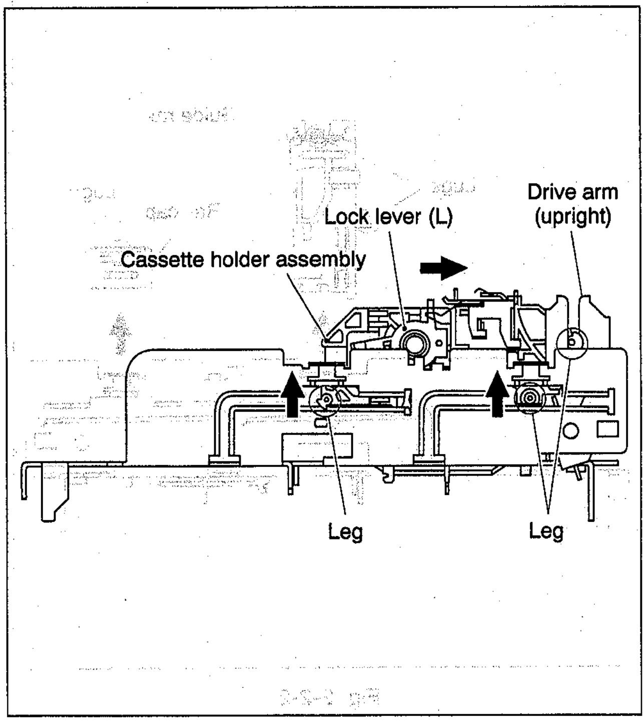

Drive arm (upright)
Lock lever (L)
Cassette holder assembly
Leg
Leg

Fig. 2-2-4

(5) While holding the left side of the cassette holder, lift the cassette holder assembly so that the three legs on the left side are all released. Then pull the legs Ⓐ and Ⓑ on the right side out of the rail and also pull up the leg Ⓒ. (See Fig.2-2-5, Fig.2-2-6)

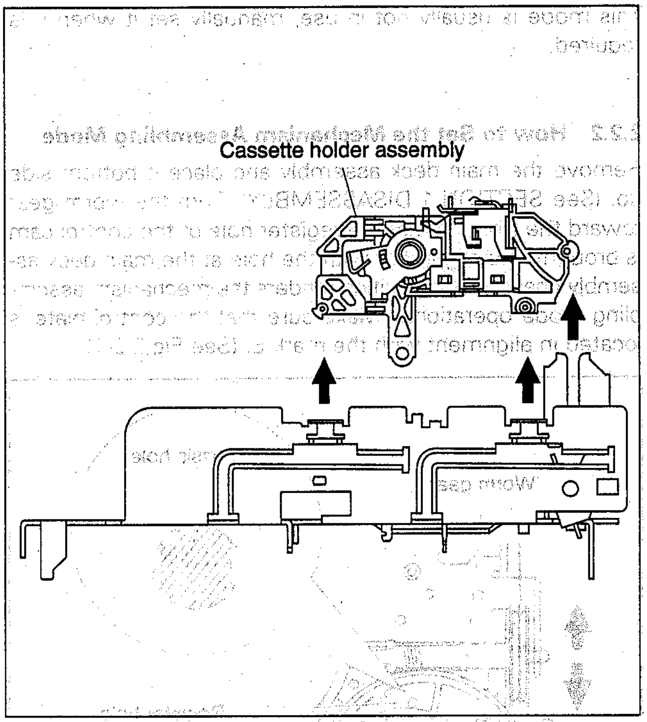

Cassette holder assembly

Fig. 2-2-5

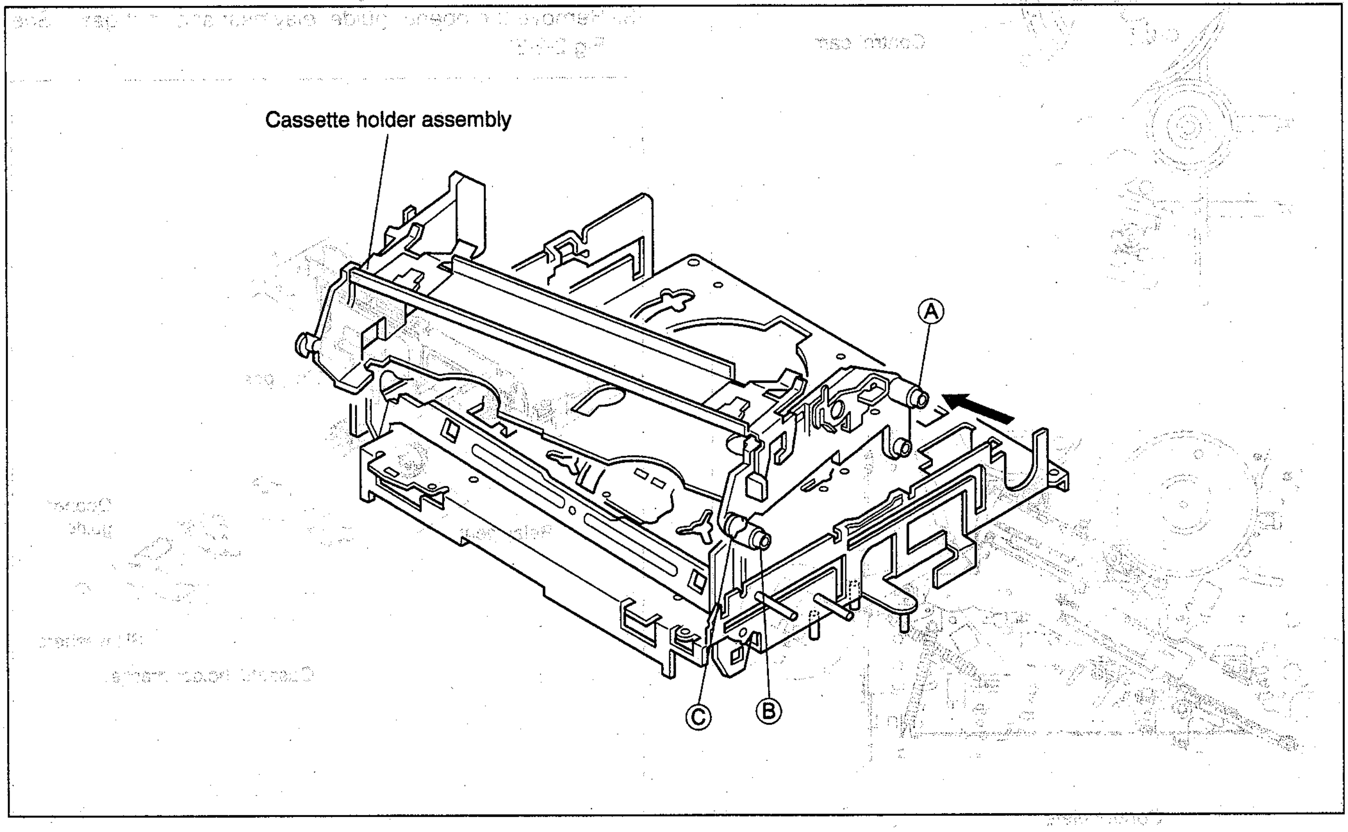

Cassette holder assembly
Ⓐ
Ⓒ
Ⓑ

Fig. 2-2-6

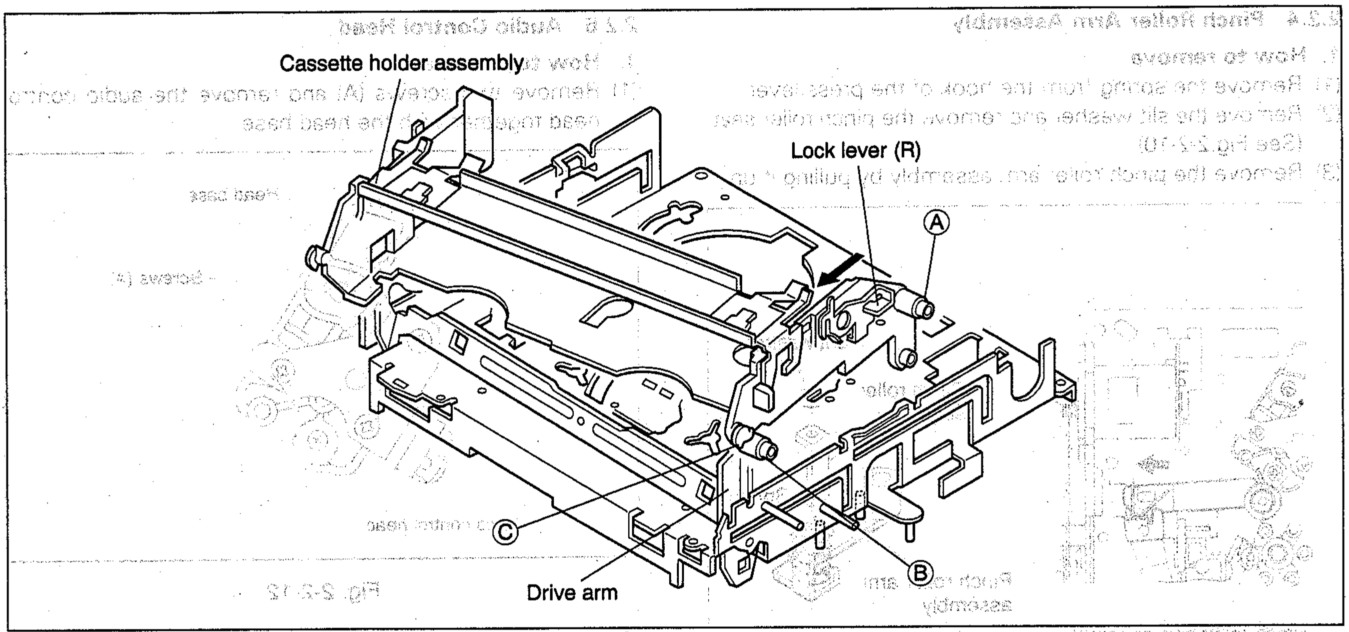

Cassette holder assembly
Lock lever (R)
Ⓐ
Ⓒ
Ⓑ
Drive arm

Fig. 2-2-7

2. How to install

(1) Hold the drive arm upright and fit the leg Ⓒ on the right side of the cassette holder assembly into the groove. (See Fig.2-2-7)

(2) While swinging the lock lever (R) of the cassette holder assembly toward front, put the legs Ⓐ and Ⓑ into the rail. (See Fig.2-2-7)

(3) Drop the three legs on the left side of the cassette holder into the groove at one time. (See Fig.2-2-8)

(4) Slide the whole cassette holder toward the front to bring it to the eject end position.

(5) Install the limit gear so that the notch on the outer circumference of the limit gear is brought into alignment with the register hole on the main deck. (See Fig.2-2-9)

(6) Install the relay gear so that the notch on the outer circumference of the relay gear is brought into alignment with the notch on the main deck. It is important at this stage that the register hole at the limit gear, the register hole at the relay gear and the register hole at the drive gear are all in alignment. (See Fig.2-2-9).

(7) Install the door stopper, opener guide and cassette holder bracket and fasten the two slit washers.

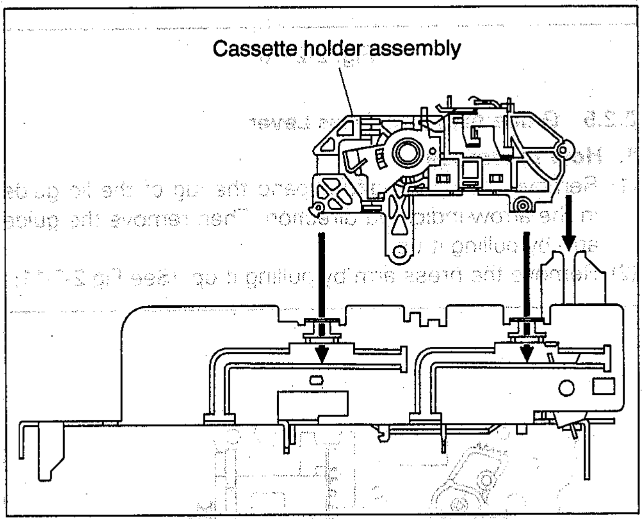

Cassette holder assembly

Fig. 2-2-8

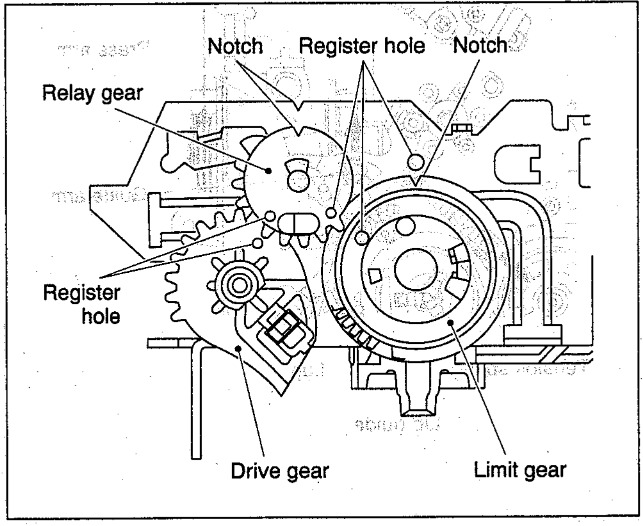

Notch
Register hole
Notch
Relay gear
Register hole
Drive gear
Limit gear

Fig. 2-2-9

2.2.4 Pinch Roller Arm Assembly

1. How to remove

(1) Remove the spring from the hook of the press lever.

(2) Remove the slit washer and remove the pinch roller seat. (See Fig.2-2-10)

(3) Remove the pinch roller arm assembly by pulling it up.

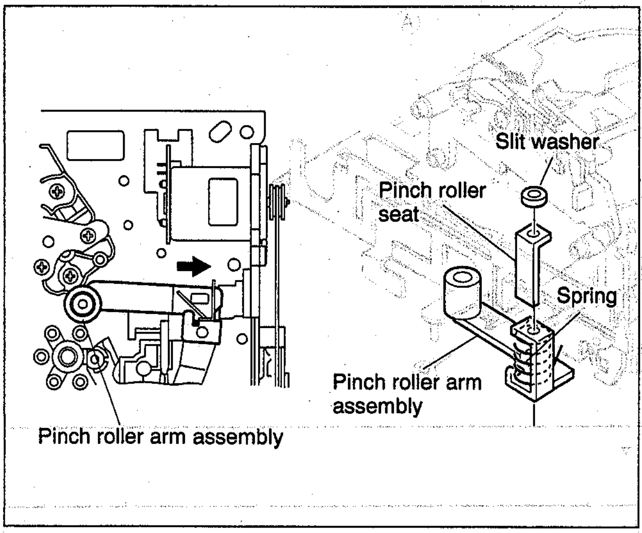

Slit washer
Pinch roller seat
Spring
Pinch roller arm assembly
Pinch roller arm assembly

Fig. 2-2-10

2.2.5 Guide Arm and Press Lever

1. How to remove

(1) Remove the spring and expand the lug of the lid guide in the arrow-indicated direction. Then remove the guide arm by pulling it up.

(2) Remove the press arm by pulling it up. (See Fig.2-2-11)

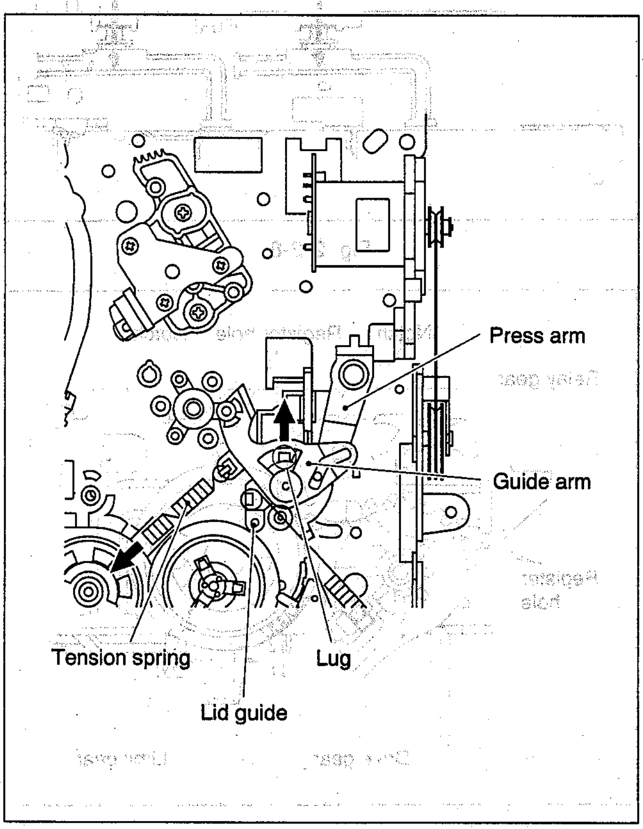

Press arm
Guide arm
Tension spring
Lug
Lid guide

Fig. 2-2-11

2.2.6 Audio Control Head

1. How to remove

(1) Remove two screws (A) and remove the audio control head together with the head base.

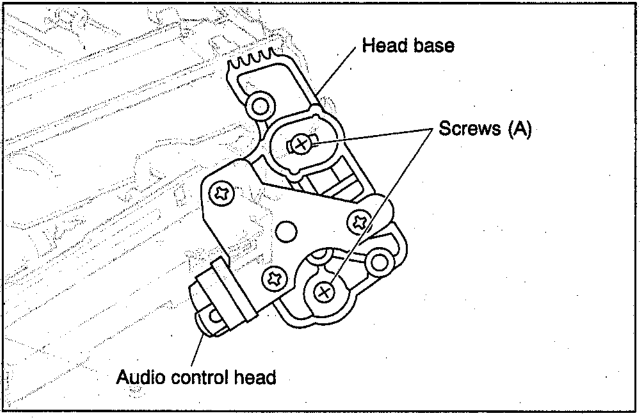

Head base
Screws (A)
Audio control head

Fig. 2-2-12

(2) When replacing only the audio control head, remove the three screws (B) while controlling the compression spring.

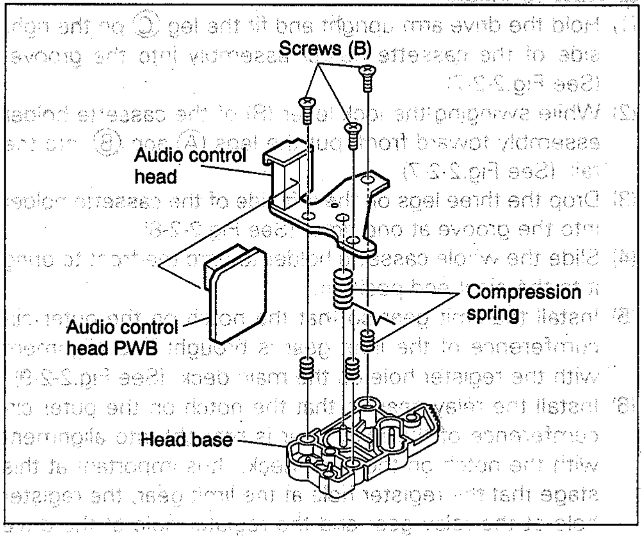

Screws (B)
Audio control head
Compression spring
Audio control head PWB
Head base

Fig. 2-2-13

2. How to install

(1) To make the post-installation adjustment easier, set the temporary level as indicated in Fig.2-2-14. Also make sure that the screw center is brought into alignment with the center position of the slot.

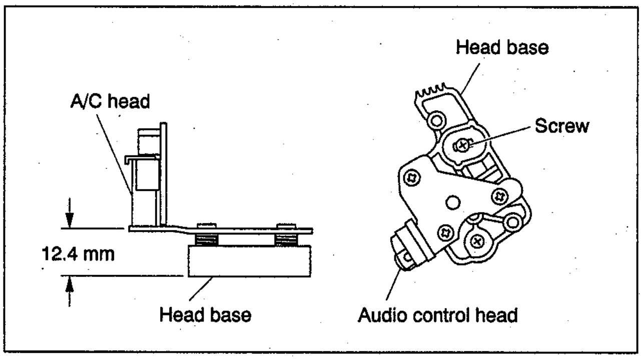

A/C head
12.4 mm
Head base
Head base
Screw
Audio control head

Fig. 2-2-14

2.2.7 Loading Motor

1. How to remove

(1) Remove the belt wound around the worm gear.

(2) Open the two lugs of the motor guide and remove the loading motor, loading motor PWB and motor guide altogether by pulling them up.

(3) When replacing the motor base, take care with the orientation of the motor (so that the label faces upward).

(4) When the motor pulley has been replaced, choose the fitting dimension as indicated in Fig.2-2-15.

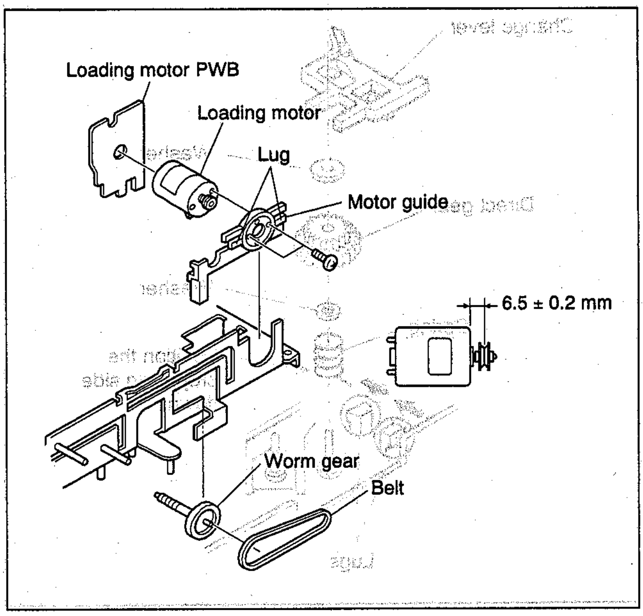


Fig. 2-2-15

2.2.8 Capstan Motor

1. How to remove

(1) Remove the belt (capstan) on the main deck back side.

(2) Remove three screws (A) and remove the capstan motor.

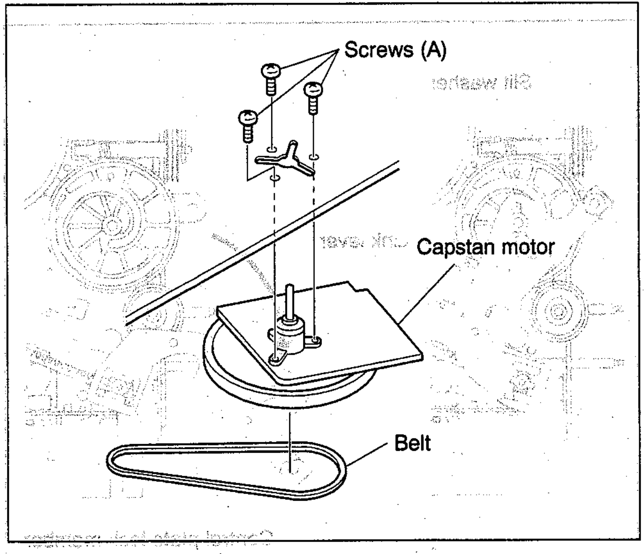


Fig. 2-2-16

2. How to install

Please refer to page 2-25.

2.2.9 Pole Base (on the supply or take-up side)

1. How to remove

(1) Remove the UV catcher on the removal side by loosening one screw (A).

(2) Remove the pole base on the supply side from the main deck by loosening one screw (B) on the main deck back side and sliding the pole base toward the UV catcher.

(3) As for the pole base on the take-up side, turn the pulley of the loading motor to lower the cassette holder because the screw (B) is hidden under the control plate (See the "Procedures for Lowering the Cassette holder assembly" on page 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD). Further turn the motor pulley to move the cassette holder until the screw (B) is no longer under the control plate (in the half-loading position). Then remove it as done for the supply side by removing one screw (B).

NOTE: *After reinstalling the Pole base and the UV catcher, be sure to perform compatibility adjustment.*

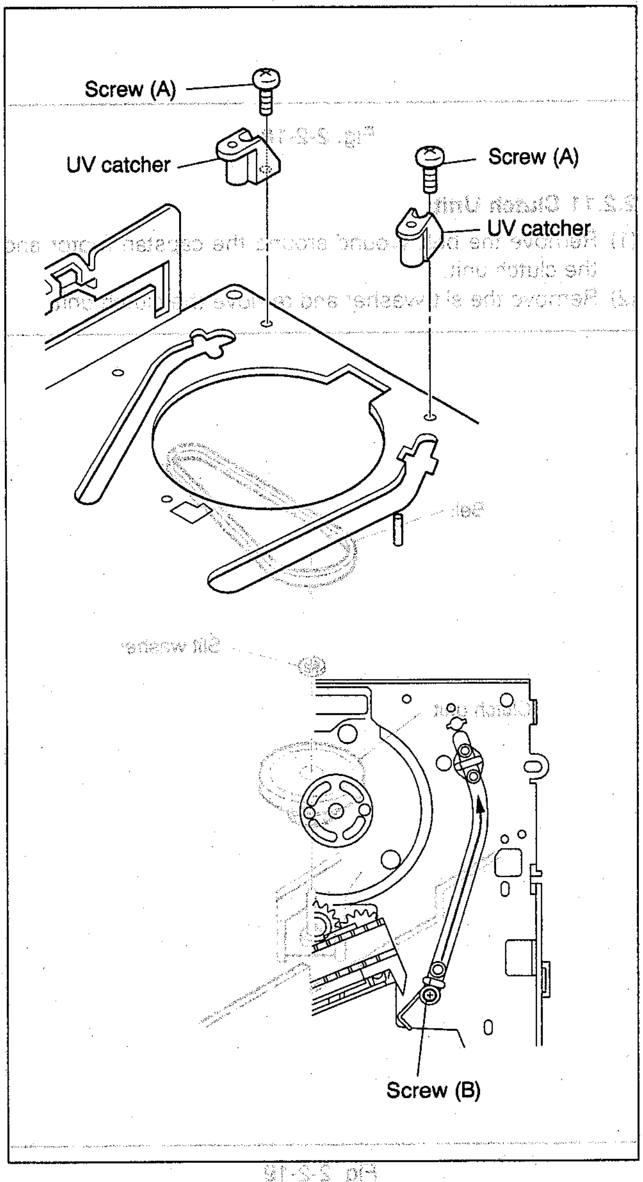


Fig. 2-2-17

2.2.10 Rotary Encoder

(1) Remove one screw (A) and remove the rotary encoder by pulling it up.

(2) When installing the rotary encoder, bring the register marks into alignment as indicated in Fig.2-2-18.

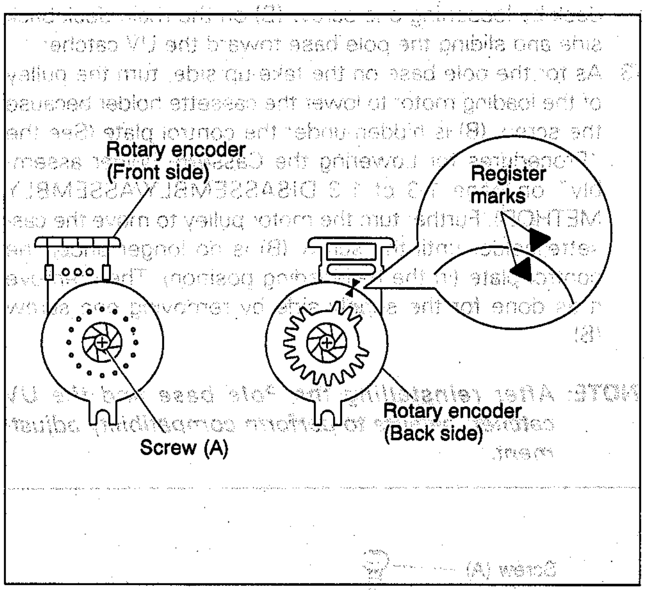

Rotary encoder
(Front side)
Register marks
Screw (A)
Rotary encoder
(Back side)

Fig. 2-2-18

2.2.11 Clutch Unit

(1) Remove the belt wound around the capstan motor and the clutch unit.

(2) Remove the slit washer and remove the clutch unit.

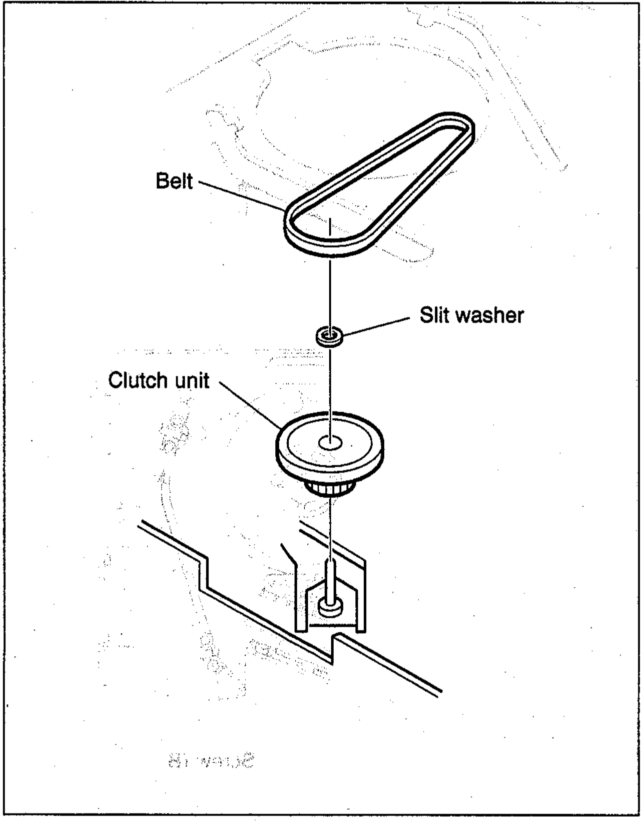

Belt
Slit washer
Clutch unit

Fig. 2-2-19

2.2.12 Change Lever and Direct Gear

(1) Release two lugs of the rotary encoder guide in the arrow-indicated direction and remove the change lever.

(2) Remove the slit washer retaining the direct gear and remove the latter.
Take care of the two washers and one spring on and under the direct gear. (See Fig.2-2-20)

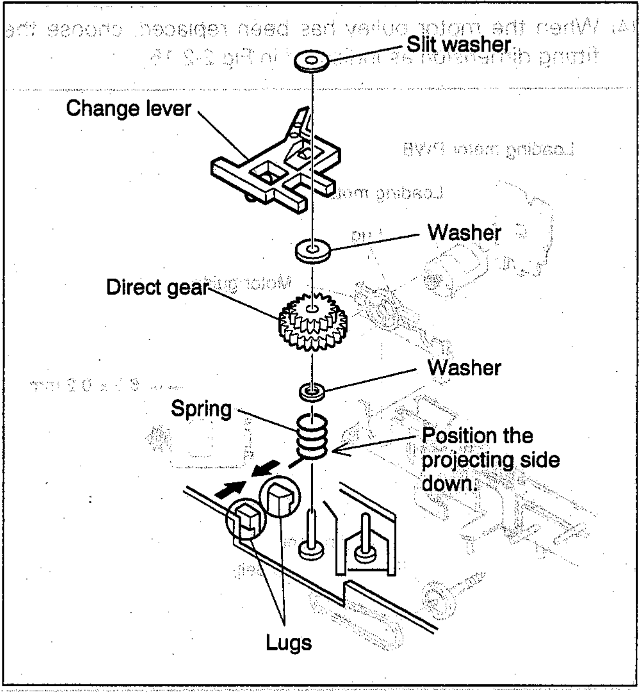

Slit washer
Change lever
Washer
Direct gear
Washer
Spring
Position the projecting side down.
Lugs

Fig. 2-2-20

2.2.13 Link Lever

(1) Remove the two slit washers.

(2) Remove the link lever by lifting it from the shaft retained by the slit washers. Then swing the link lever counterclockwise and remove it from the lock member of the control plate.

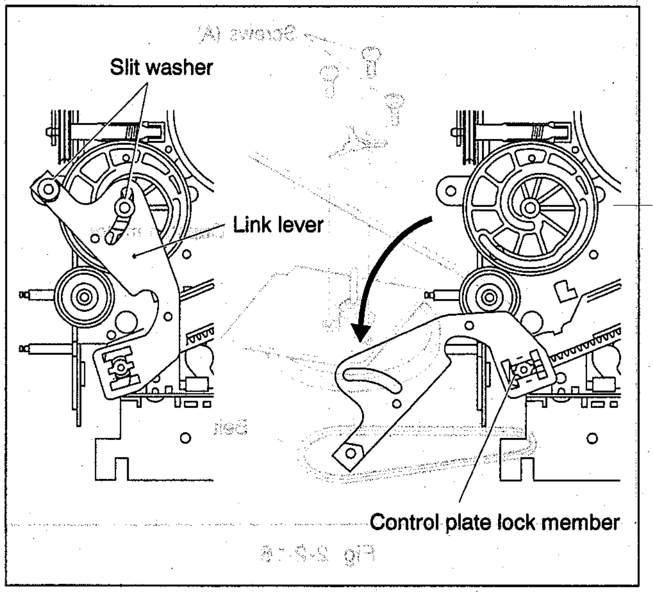

Slit washer
Link lever
Control plate lock member

Fig. 2-2-21

2.2.14 Cassette Gear, Control Cam and Worm Gear

(1) Remove the control cam by lifting it.
(2) Open the two lugs of the cassette gear outward and pull the latter off.
(3) Remove the belt wound around the worm gear and the loading motor.
(4) Open the lug of the lid guide outward and remove the worm gear.
(5) When installing the control cam, make sure that the register hole at the control cam is in alignment with the register hole of the main deck. (See Fig.2-2-22)

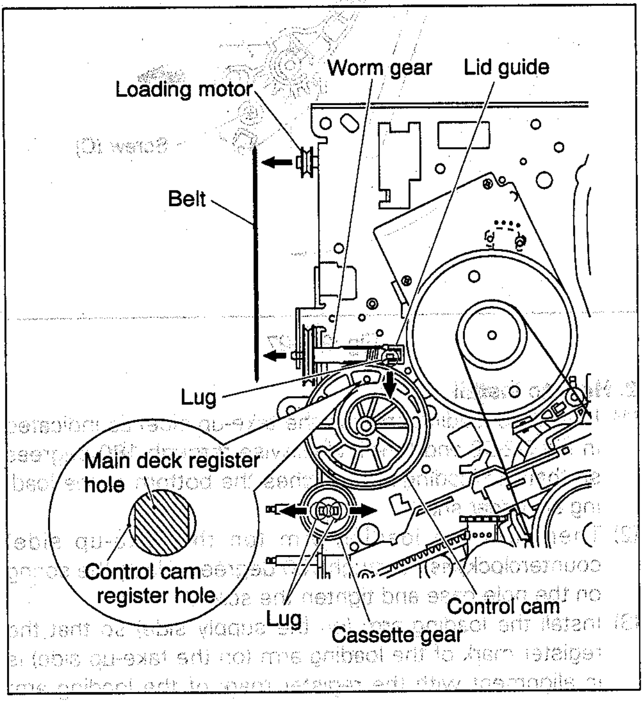

Loading motor
Worm gear
Lid guide
Belt
Lug
Main deck register hole
Control cam register hole
Lug
Control cam
Cassette gear

Fig. 2-2-22

2.2.15 Control Plate

1. How to remove

(1) Remove one screw (A) retaining the control plate bracket and remove the latter.
(2) Slide the control plate as indicated by the arrow and remove the control plate. (See Fig.2-2-23)

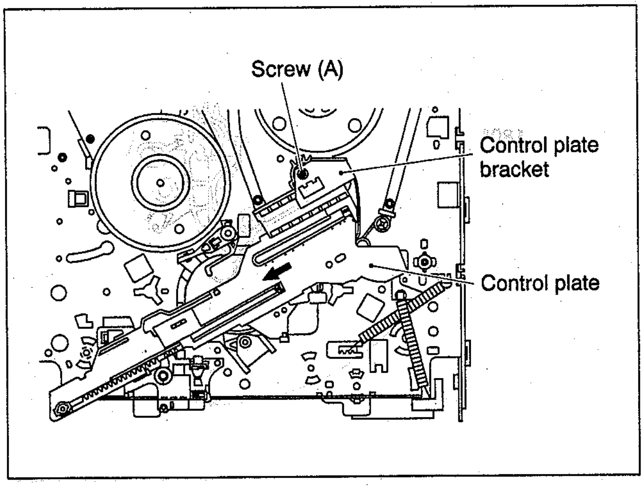

Screw (A)
Control plate bracket
Control plate

Fig. 2-2-23

2. How to install

(1) Adjust the position of the idler arm pin as indicated in Fig.2-2-24. (to the left of center of the R section)
(2) Bring the positioning hole of the take-up lever into alignment with the hole at the control plate guide and fix the position by inserting a 1.5 mm hexagonal wrench.
(3) Press-fit the pole base (on the supply side) as indicated by the arrow and install the control plate so that section A of the loading arm gear shaft fits into hole (A) of the control plate, section B of the control plate guide into hole (B), and the control plate comes under section C of the rotary encoder guide and section D of the loading arm (on the take-up side). Then slide the whole control plate in the arrow-indicated direction. (See Fig.2-2-25).
(4) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft. (See Fig.2-2-25)
(5) Pull off the hexagonal wrench for positioning.

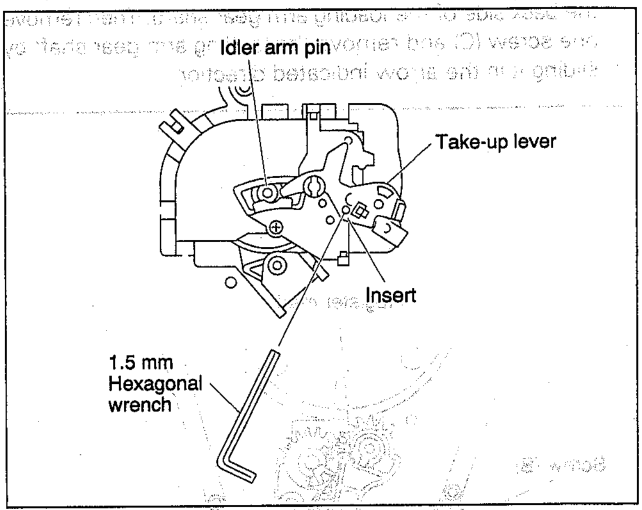

Idler arm pin
Take-up lever
Insert
1.5 mm Hexagonal wrench

Fig. 2-2-24

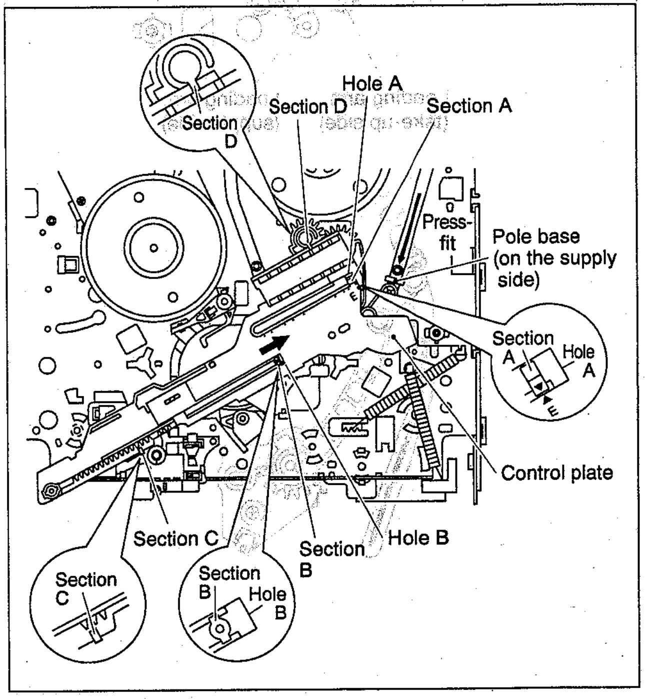

Hole A
Section D
Section A
Section D
Press-fit
Pole base (on the supply side)
Section A
Hole A
E
Control plate
Section C
Section B
Hole B
Section C
Section B
Hole B

Fig. 2-2-25

2.2.16 Loading Arm (on the supply or take-up side) and Loading Arm Gear Shaft

1. How to remove

(1) Remove the loading arm (on the supply side) by loosening screw (A) in Fig.2-2-26.

(2) Remove screw (B) in Fig.2-2-26 and slide the pole base in the loading direction with the spring held on the pole base (on the take-up side). (See Fig.2-2-26)

(3) Pull the spring out of the pole base. Turn the loading arm clockwise through about 45 degrees so that the notch of the loading arm is in alignment with the projection of the loading arm gear shaft and lift it.
Likewise, turn the loading arm counterclockwise through 180 degrees so that the notch is in alignment with the projection and remove the loading arm (on the take-up side). (See Fig.2-2-27)

(4) When removing the loading arm gear shaft, be sure of first removing the screw retaining the drum assembly (on the back side of the loading arm gear shaft). Then remove one screw (C) and remove the loading arm gear shaft by sliding it in the arrow-indicated direction.

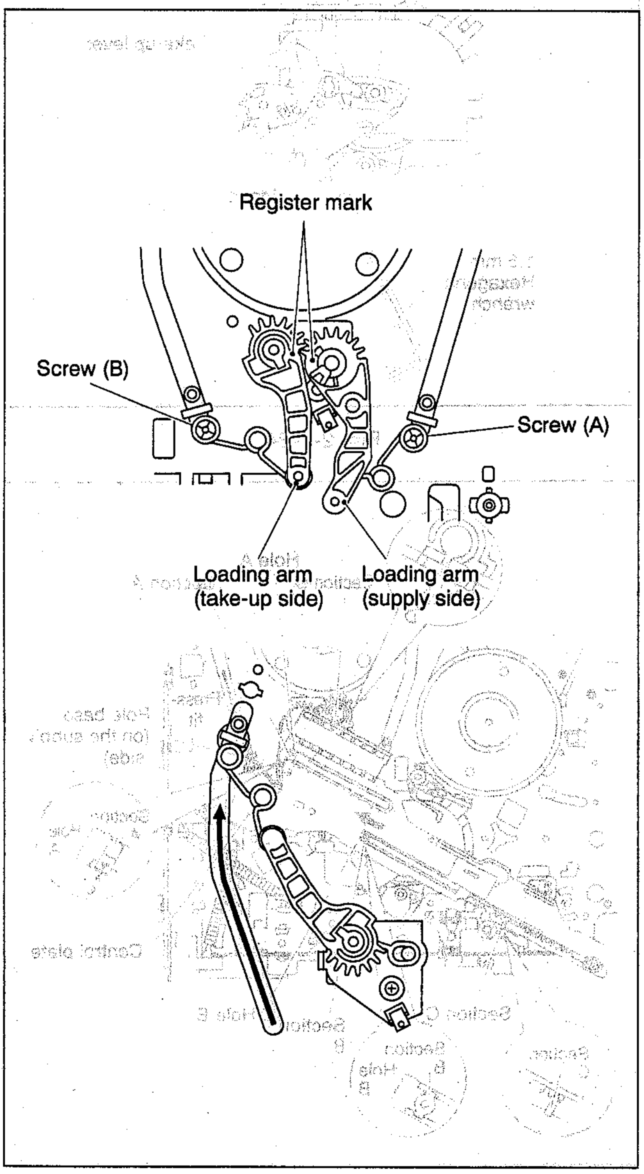


Fig. 2-2-26

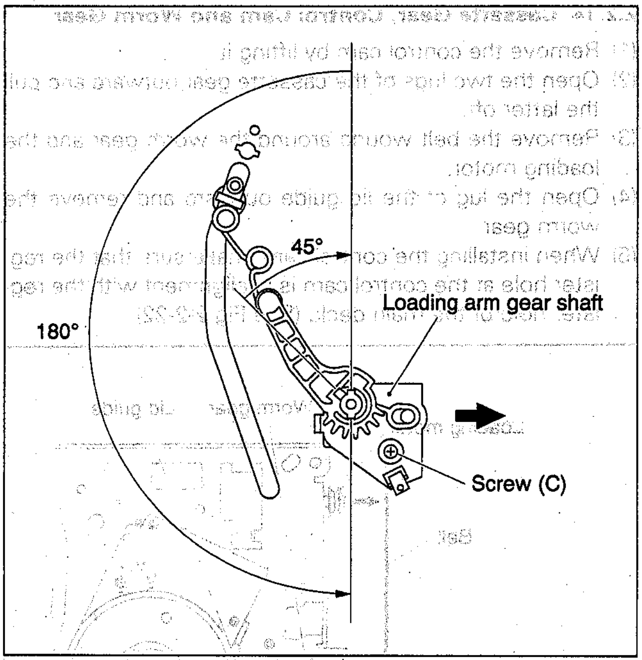


Fig. 2-2-27

2. How to install

(1) Install the loading arm (on the take-up side) as indicated in Fig.2-2-28 and turn it clockwise through 180 degrees so that the loading arm reaches the bottom of the loading arm gear shaft.

(2) Then turn the loading arm (on the take-up side) counterclockwise through 180 degrees. Hang the spring on the pole base and tighten the screw.

(3) Install the loading arm (on the supply side) so that the register mark of the loading arm (on the take-up side) is in alignment with the register mark of the loading arm (on the supply side). Then hang the spring on the pole base and tighten the screw. (See Fig.2-2-26).

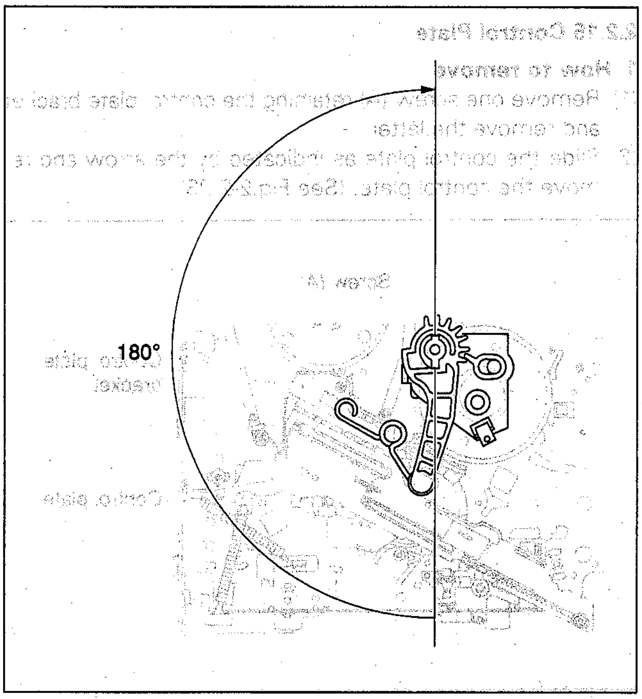


Fig. 2-2-28

2.2.17 Take-up Lever, Take-up Head and Control Plate Guide

(1) Remove the spring of the take-up lever from the main deck.

(2) Remove one lug of the take-up lever from the main deck and pull out the take-up lever and the take-up head together.

(3) Remove one screw (A).

(4) Remove two lugs of the control plate guide from the main deck. Locate the idler arm pin in the center of the R section of the control plate and remove the latter.

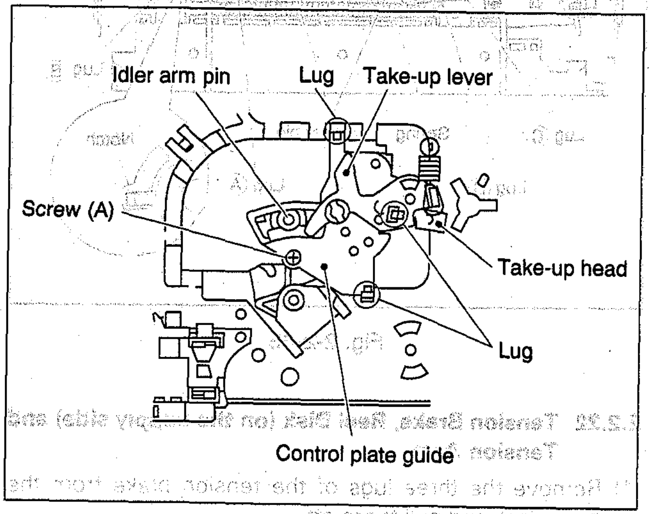


Fig. 2-2-29

2.2.18 Capstan Brake

(1) Move lug A of the capstan brake in the arrow-indicated direction so that it comes into alignment with the notch of the main deck. (See Fig. 2-2-30)

(2) Remove lug B of the capstan brake from the main deck and remove the capstan brake.

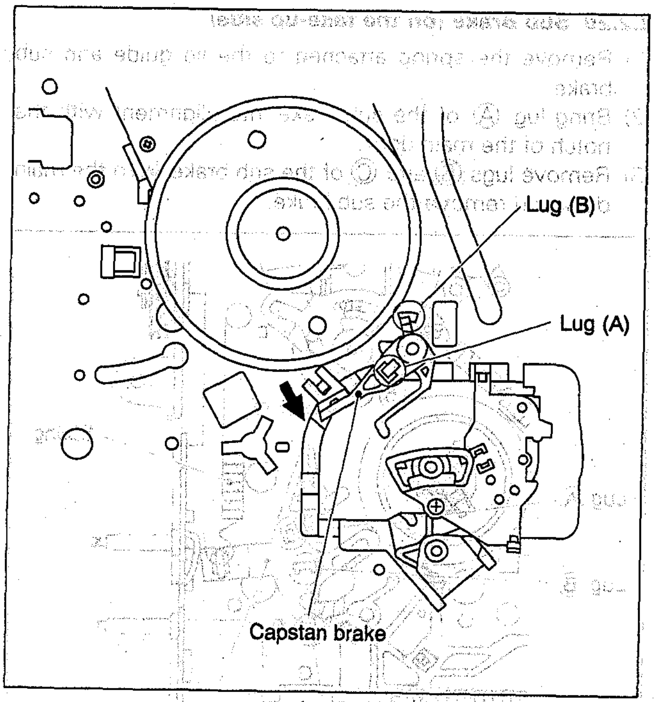


Fig. 2-2-30

2.2.19 Drive Gear and Drive Arm

1. How to remove

(1) Remove the cassette holder assembly. (See 2.2.3 How to remove the cassette holder assembly)

(2) Pull out the drive gear and remove the drive arm.

2. How to install

(1) Insert section A of the drive arm into section B of the main deck.

(2) Insert section ① of drive gear into hole ○ of the drive arm and section ② into hole □. (See Fig. 2-2-31)

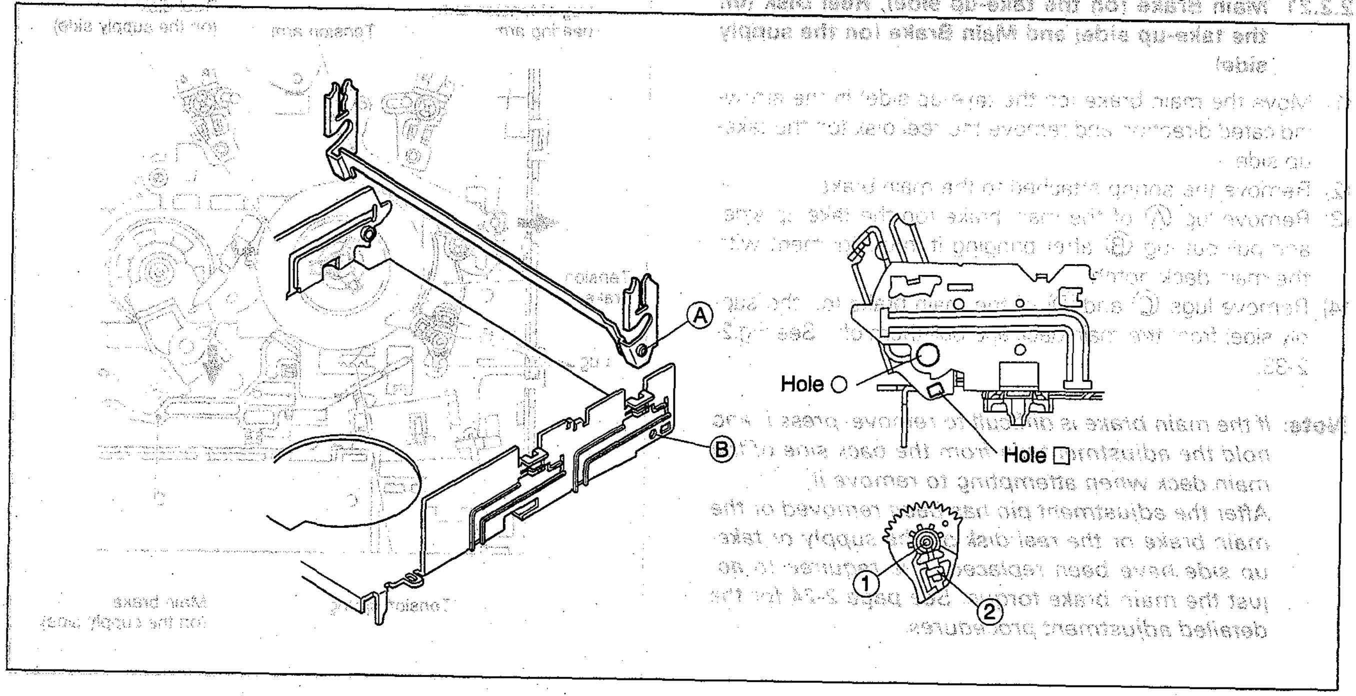


Fig. 2-2-31

2.2.20 Sub Brake (on the take-up side)

(1) Remove the spring attached to the lid guide and sub brake.
(2) Bring lug Ⓐ of the sub brake into alignment with the notch of the main deck.
(3) Remove lugs Ⓑ and Ⓒ of the sub brake from the main deck and remove the sub brake.

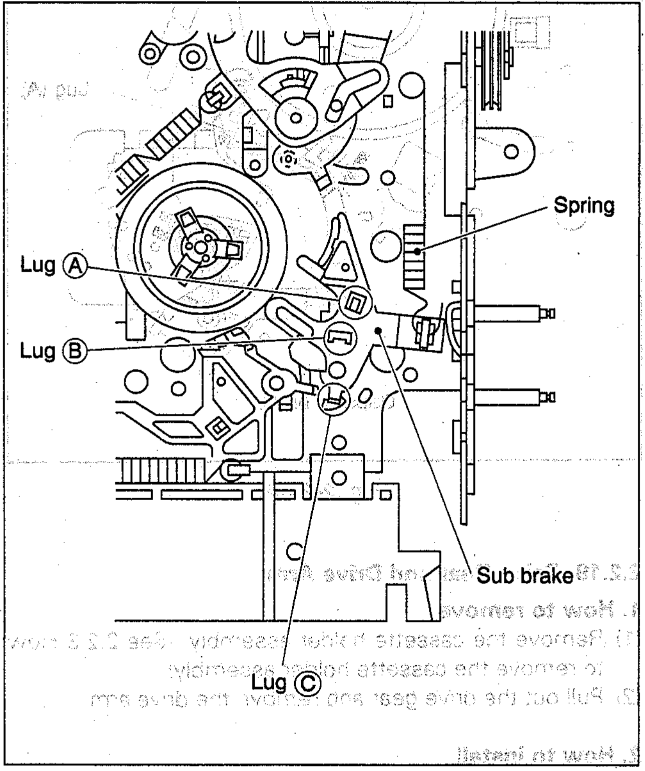

Spring
Lug Ⓐ
Lug Ⓑ
Sub brake
Lug Ⓒ

Fig. 2-2-32

2.2.21 Main Brake (on the take-up side), Reel Disk (on the take-up side) and Main Brake (on the supply side)

(1) Move the main brake (on the take-up side) in the arrow-indicated direction and remove the reel disk (on the take-up side).
(2) Remove the spring attached to the main brake.
(3) Remove lug Ⓐ of the main brake (on the take-up side) and pull out lug Ⓑ after bringing it into alignment with the main deck notch.
(4) Remove lugs Ⓒ and Ⓓ of the main brake (on the supply side) from the main deck and pull them off. (See Fig.2-2-33)

Note: *If the main brake is difficult to remove, press it and hold the adjustment pin from the back side of the main deck when attempting to remove it.*
After the adjustment pin has been removed or the main brake or the reel disk on the supply or take-up side have been replaced, it is required to adjust the main brake torque. See page 2-24 for the detailed adjustment procedures.

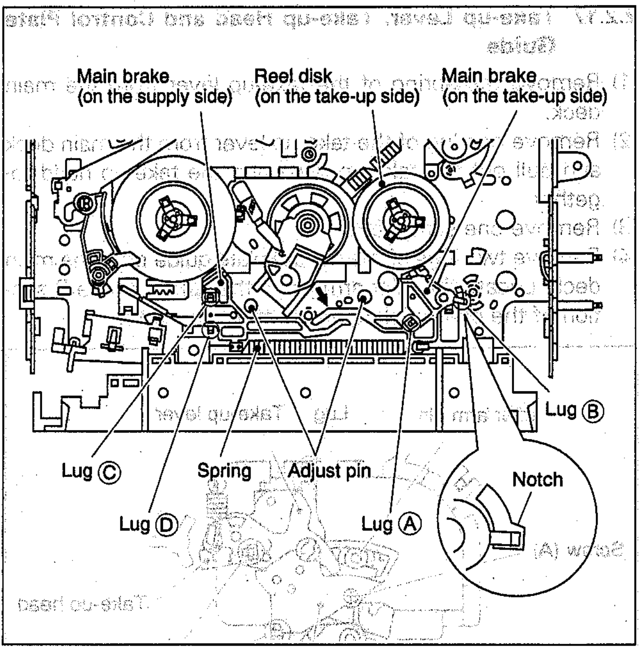

Main brake (on the supply side)
Reel disk (on the take-up side)
Main brake (on the take-up side)
Lug Ⓑ
Lug Ⓒ
Spring
Adjust pin
Notch
Lug Ⓓ
Lug Ⓐ

Fig. 2-2-33

2.2.22 Tension Brake, Reel Disk (on the supply side) and Tension Arm

(1) Remove the three lugs of the tension brake from the main deck and pull them off.
(2) Remove the reel disk (on the supply side) by loosening in the arrow-indicated direction the main brake (on the supply side).
(3) Remove the tension spring on the main deck back side and remove the lugs of the tension arm bearing to pull up and remove the tension arm. (See Fig.2-2-34)

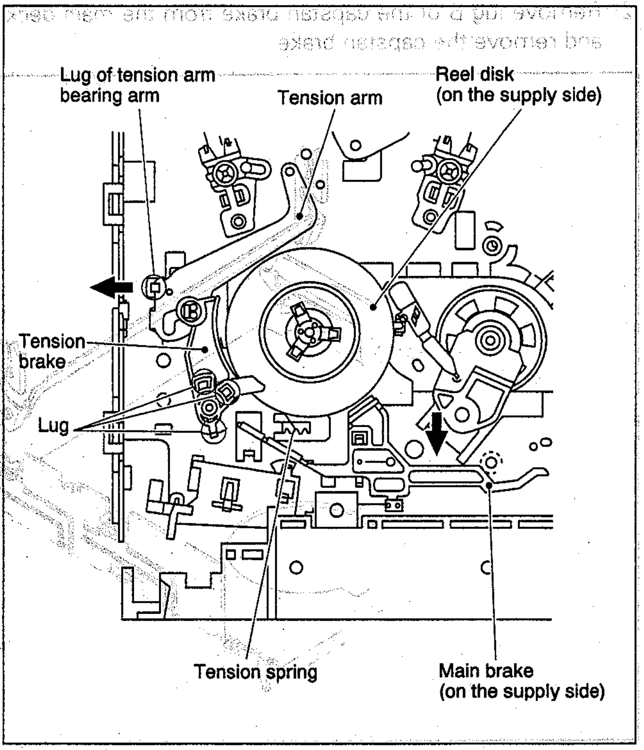

Lug of tension arm bearing arm
Tension arm
Reel disk (on the supply side)
Tension brake
Lug
Tension spring
Main brake (on the supply side)

Fig. 2-2-34

2.2.23 Idler Lever, Idler Arm and Reel Shaft

(1) Remove one lug of the idler lever from the main deck and remove the hook fitted in the idler arm hole by lifting it.
(2) Remove the slit washer and pull out the idler arm.
(3) Turn the reel shaft counterclockwise through 60 degrees and remove it. (See Fig.2-2-35)

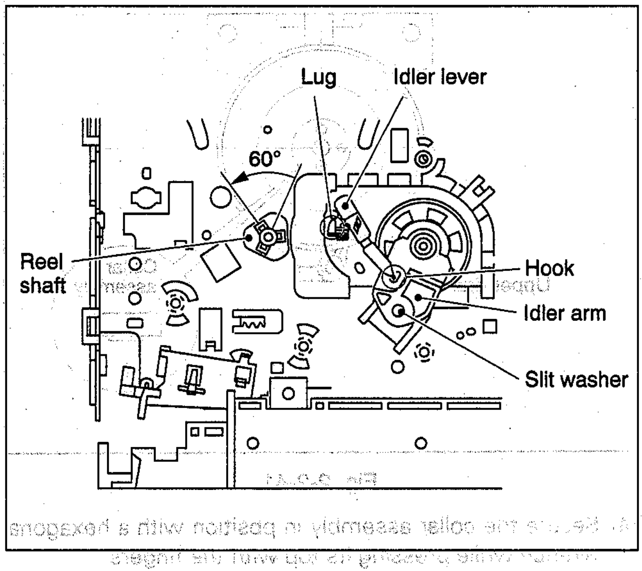

Lug
Idler lever
60°
Reel shaft
Hook
Idler arm
Slit washer

Fig. 2-2-35

2.2.24 Stator Assembly

(1) Remove two screws (A).
(2) Remove the stator assembly by lifting in the arrow-indicated direction (Take care that the brush spring does not jump out).
(3) Remove the flat cable.
(4) After installation, be sure to perform the 3.2.1 PB switching point adjustment according to the electrical adjustment procedure.

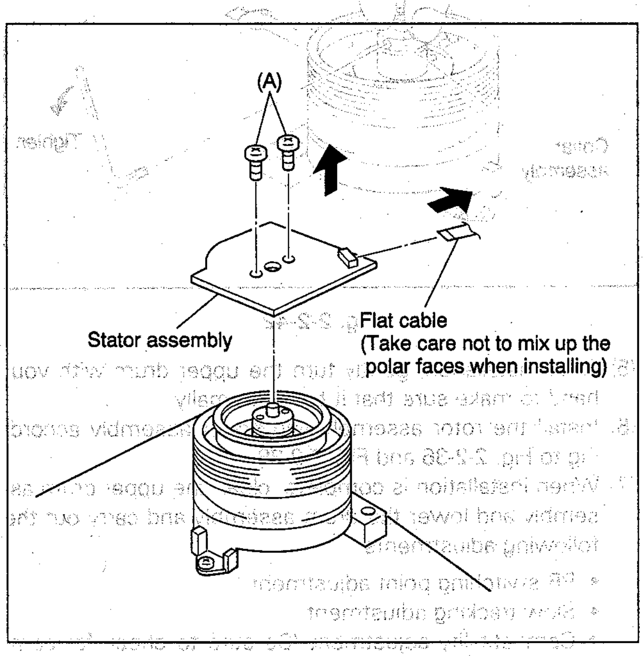

(A)
Stator assembly
Flat cable
(Take care not to mix up the polar faces when installing)

Fig. 2-2-36

2.2.25 Rotor Assembly

(1) Remove the stator assembly.
(2) Remove the two screws (B) and remove the rotor assembly.

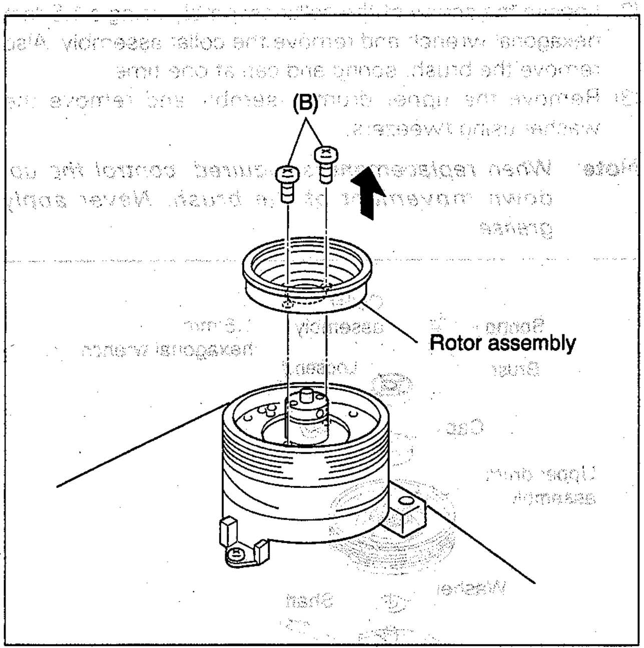

(B)
Rotor assembly

Fig. 2-2-37

Note: *When installing the rotor assembly, note that a normal picture cannot be obtained without ensuring the phase matching as mentioned below.*

(3) Match the phases of the upper drum and the rotor assembly as indicated in Fig.2-2-38.
(4) Place the upper drum hole (a) over the rotor assembly holes (b) (with three holes to be aligned) and tighten the two screws (B). (See Fig.2-2-38)

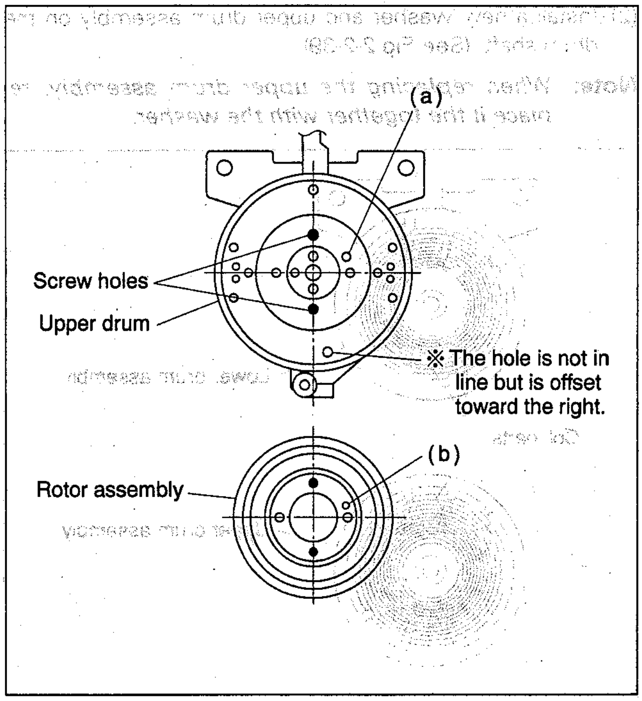

(a)
Screw holes
Upper drum
※The hole is not in line but is offset toward the right.
(b)
Rotor assembly

Fig. 2-2-38

2.2.26 Upper Drum Assembly

1. How to remove

(1) Remove the stator assembly and rotor assembly. (See Fig. 2-2-36 and Fig. 2-2-37)

(2) Loosen the screw of the collar assembly using a 1.5 mm hexagonal wrench and remove the collar assembly. Also remove the brush, spring and cap at one time.

(3) Remove the upper drum assembly and remove the washer using tweezers.

Note: *When replacement is required, control the up-down movement of the brush. Never apply grease.*

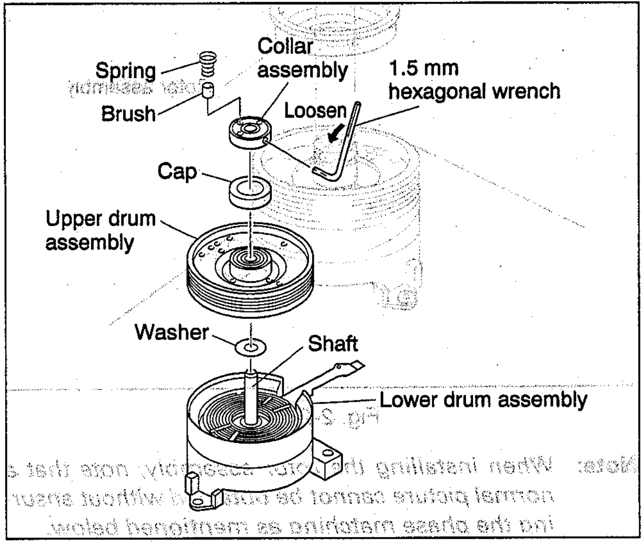

Spring
Collar assembly
1.5 mm hexagonal wrench
Brush
Loosen
Cap
Upper drum assembly
Washer
Shaft
Lower drum assembly

Fig. 2-2-39 Upper drum assembly-1

2. How to install

(1) Clean coil parts of the lower drum assembly and the newly installed upper drum assembly with an air brush in advance. (See Fig.2-2-40).

(2) Install a new washer and upper drum assembly on the drum shaft. (See Fig.2-2-39)

Note: *When replacing the upper drum assembly, replace it the together with the washer.*

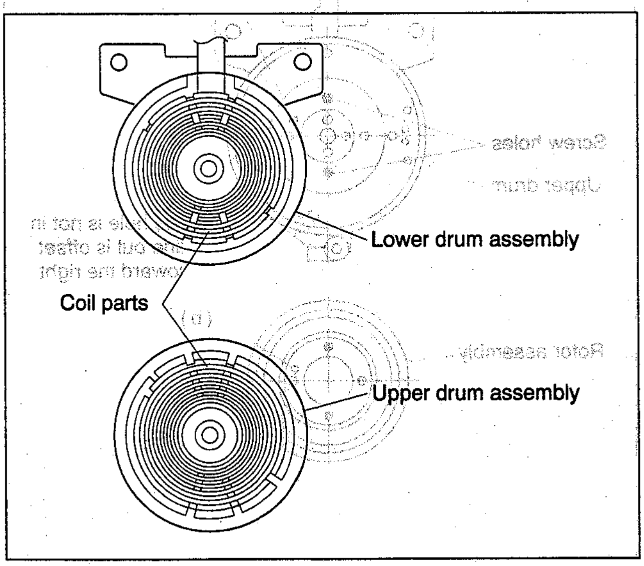

Lower drum assembly
Coil parts
Upper drum assembly

Fig. 2-2-40

(3) Position the collar assembly as indicated in Fig.2-41 while controlling its up- down movement.

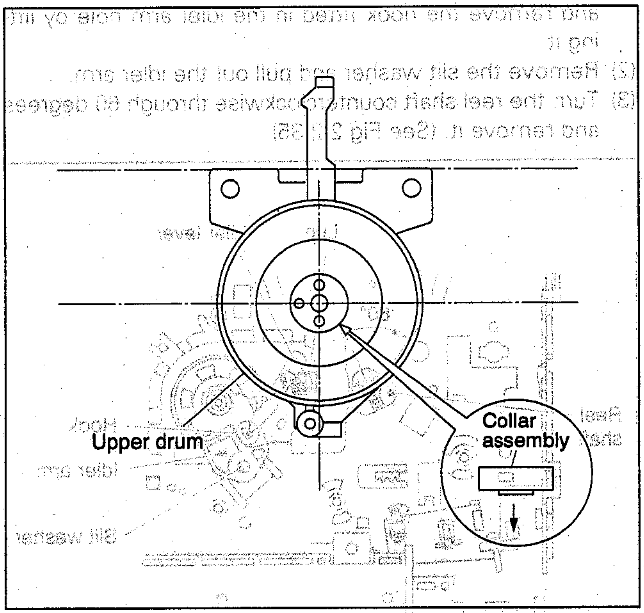

Upper drum
Collar assembly

Fig. 2-2-41

(4) Secure the collar assembly in position with a hexagonal wrench while pressing its top with the fingers.

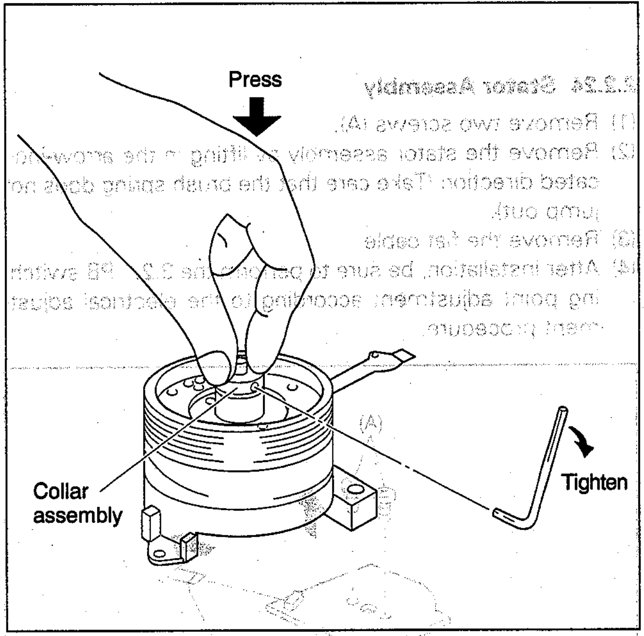

Press
Collar assembly
Tighten

Fig. 2-2-42

(5) After installation, gently turn the upper drum with your hand to make sure that it turns normally.

(6) Install the rotor assembly and stator assembly according to Fig. 2-2-36 and Fig. 2-2-38.

(7) When installation is complete, clean the upper drum assembly and lower the drum assembly and carry out the following adjustments.

- PB switching point adjustment
- Slow tracking adjustment
- Compatibility adjustment (Be sure to check for compatibility for the EP mode.)

2.3 MAJOR PARTS INSTALLATION (PHASE MATCHING BETWEEN MECHANICAL PARTS)

2.3.1 Before Assembly of the Parts

The mechanism of this unit is closely linked with the rotary encoder and system controller circuits.
Since the system controller detects the status of mechanical operation in response to phases of the rotary encoder (internal switch positions), the mechanism may not operate properly unless such parts as the rotary encoder, control plate, loading arm assembly, control cam, cassette gear, limit gear, relay gear and drive gear are installed in their correct positions.
Especially, this model is not provided with any cassette housing assembly, so that cassette loading and unloading must be accomplished by operation of the cassette holder assembly. The latter is in turn driven by such parts as drive gear, relay gear and limit gear. Exercise enough care, therefore, to have the phases of all this gear matching one another.
Perform the installation of major parts (including phase matching) in the mechanism assembling mode as in the previous section.

2.3.2 Loading Arm Assembly (on the Supply or Take-up Side)

(1) Return the pole base assembly to the foremost position in the unloading direction.
(2) Install the loading arm assembly so that the register mark on the gear of the supply side loading arm is in alignment with the one on the take-up side loading arm as indicated in Fig. 2-3-1.
See 2.2.16 "2. How to install" of the foregoing section for details of installation.

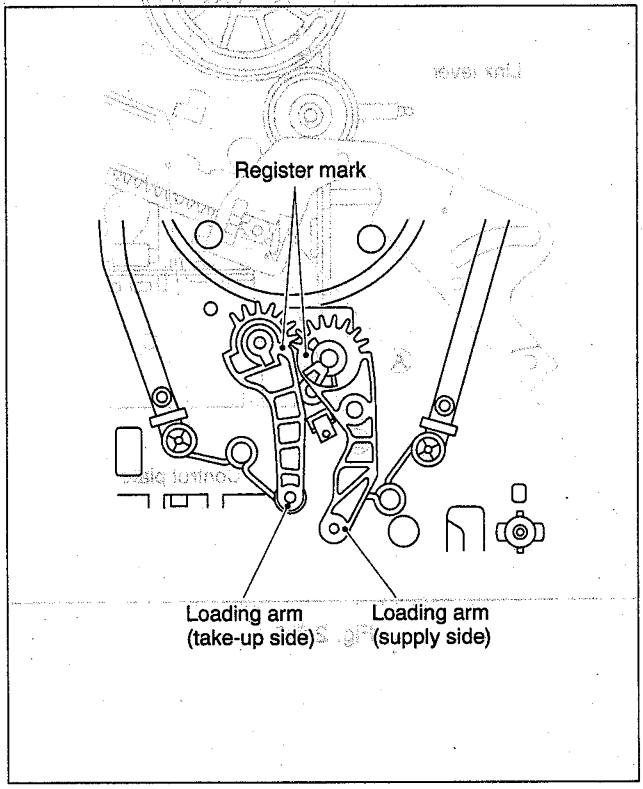


Fig. 2-3-1

2.3.3 Control Plate

(1) With register marks on the both loading arm assemblies in alignment, install the control plate so that the mark ▼ on the loading arm gear shaft is in alignment with mark E of the control plate. (See Fig.2-3-2)
See 2.2.15 "2. How to install" of the foregoing section for details of installation.

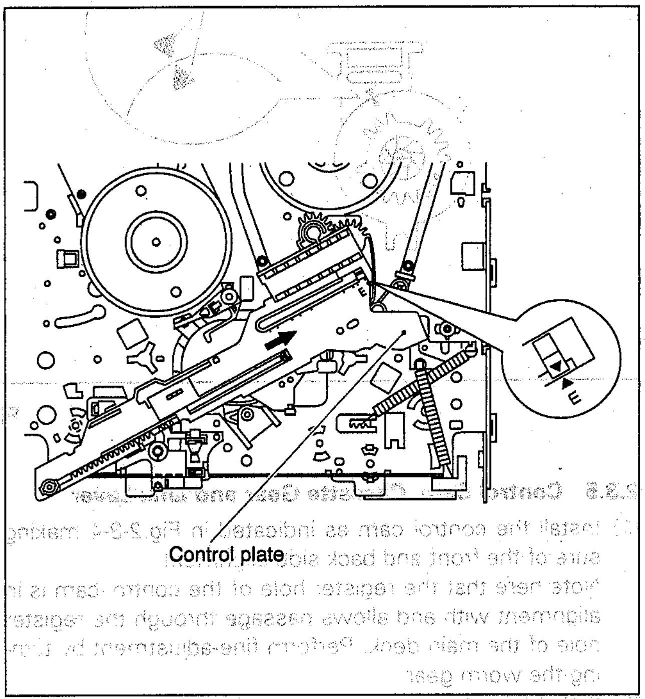


Fig. 2-3-2

2.3.4 Rotary Encoder

(1) Make sure that the mark E of the control plate is in alignment with the mark ü+ of the loading arm gear shaft and bring the register marks on the rotary encoder into alignment as indicated in Fig.2-3-3.
(2) Turn over the rotary encoder with its register marks kept in alignment and install it by fitting on the shaft of the rotary encoder guide and the positioning pin.
(3) Tighten the screw (A) to complete the installation.

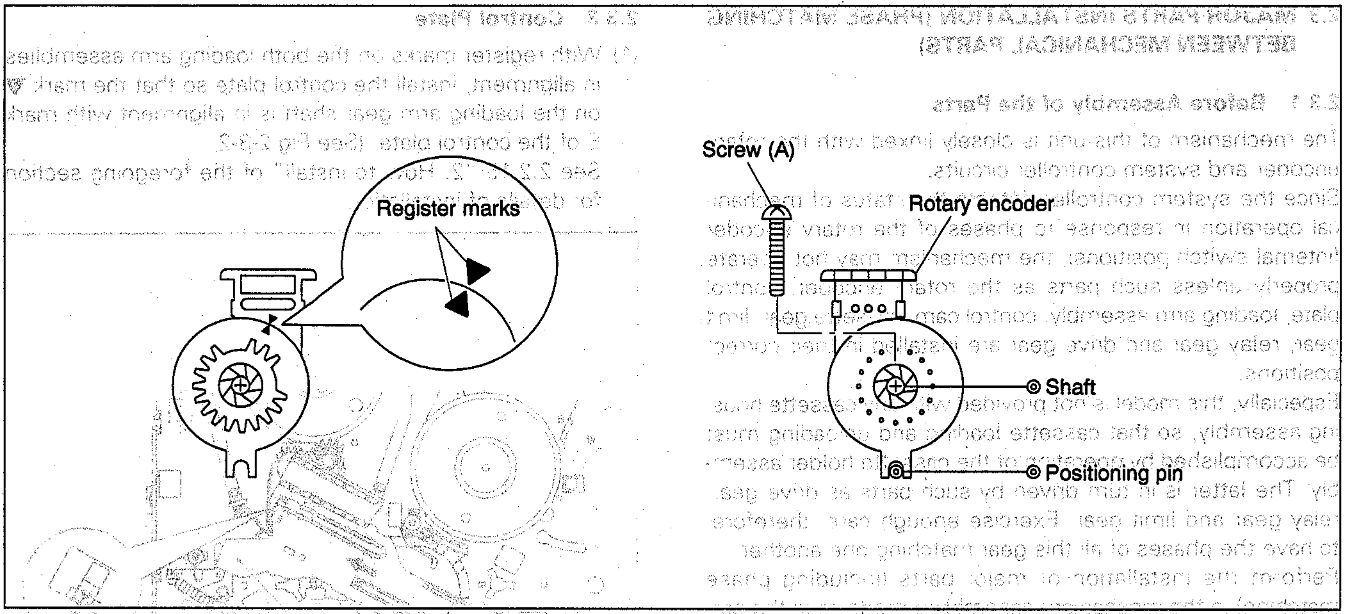

Register marks
Screw (A)
Rotary encoder
Shaft
Positioning pin

Fig. 2-3-3

2.3.5 Control Cam, Cassette Gear and Link Lever

(1) Install the control cam as indicated in Fig.2-3-4 making sure of the front and back side alignment.
Note here that the register hole of the control cam is in alignment with and allows passage through the register hole of the main deck. Perform fine-adjustment by turning the worm gear.

(2) Install the cassette gear by pushing it until it is locked with a clicking sound. (See Fig.2-3-4)

(3) Insert section (A) of the link lever into section (B) of the control plate as shown in Fig.2-3-5.

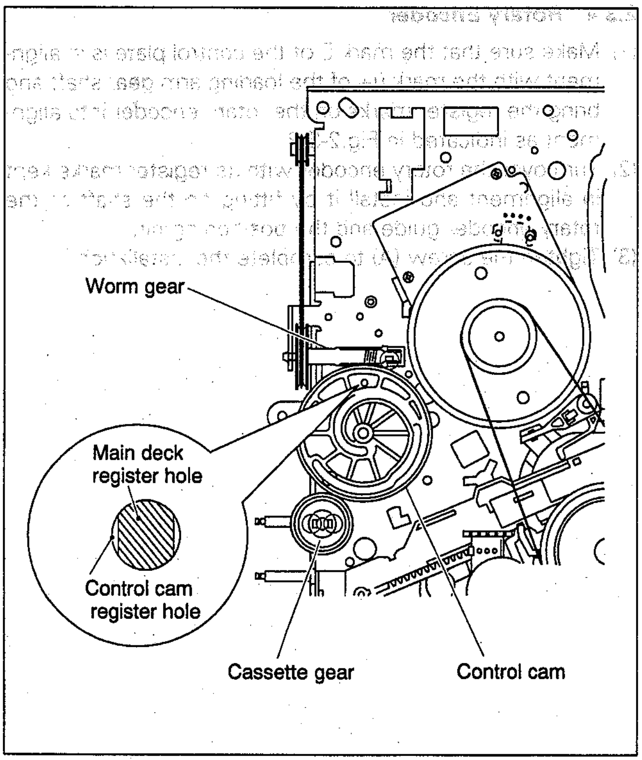

Worm gear
Main deck register hole
Control cam register hole
Cassette gear
Control cam

Fig. 2-3-4

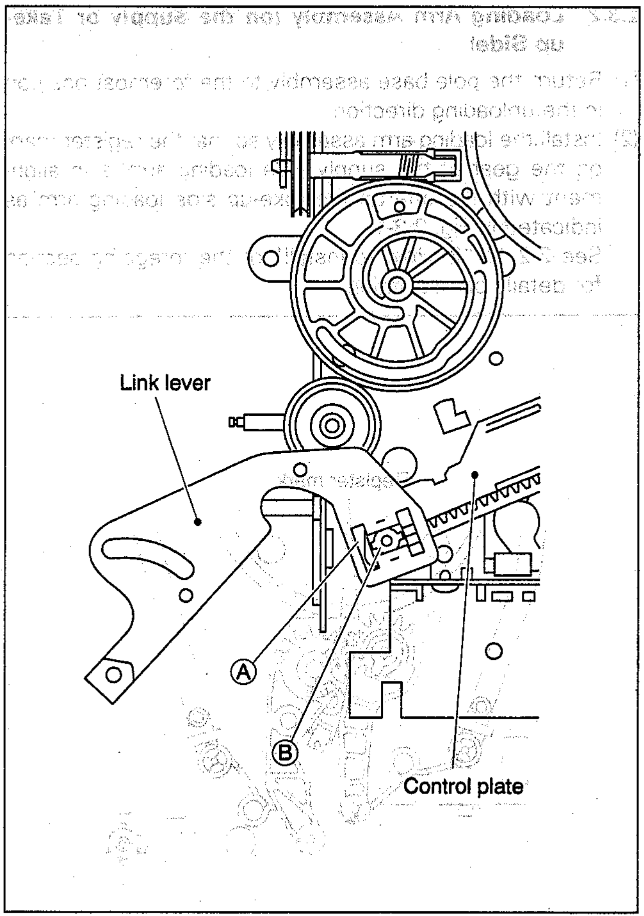

Link lever
Ⓐ
Ⓑ
Control plate

Fig. 2-3-5

(4) Turn the link lever clockwise and mount it on the control cam center shaft Ⓐ and the control cam left-side shaft Ⓑ. (See Fig.2-3-6).

(5) Fasten the slit washers at two points Ⓐ and Ⓑ.

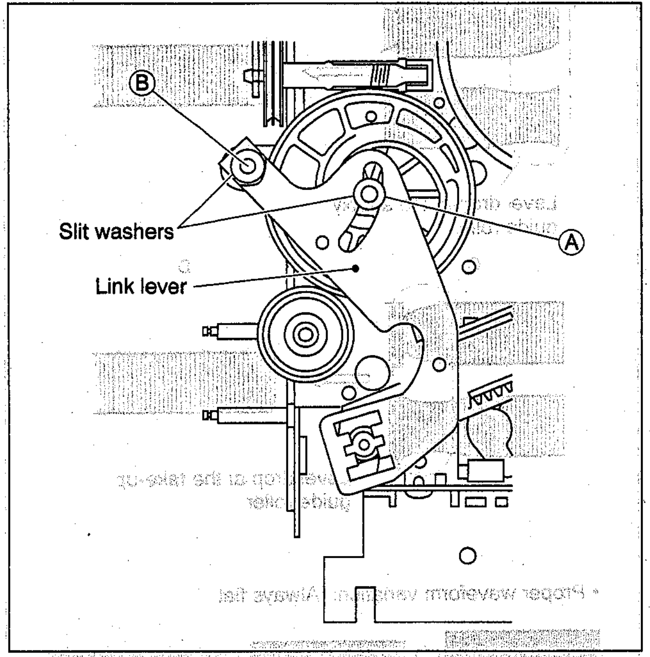


Fig. 2-3-6

2.3.6 Relay Gear, Limit Gear and Drive Gear

(1) Install the limit gear so that the notch at its outer circumference is in alignment with the register hole of the main deck.(See Fig.2-3-7)

(2) Install so that the notch at the outer circumference of the relay gear is in alignment with the notch of the main deck, and at the same time, that the hole A of the relay gear is in alignment with hole A of the limit gear and hole B of the relay gear with hole B of the drive gear. (See Fig.2-3-7)

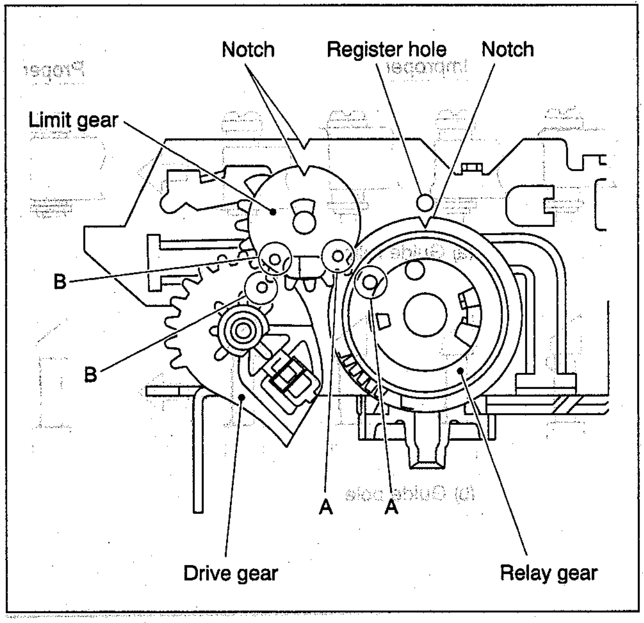


Fig. 2-3-7

2.4 COMPATIBILITY ADJUSTMENT

Notes:
- *Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the audio control head, drum assembly or any part of the tape transport system.*
- *To avoid any damage to the alignment tape while performing the compatibility adjustment, get a separate cassette tape (for recording and play back) ready to be used for checking the initial tape running behavior.*

2.4.1 Checking/Adjustment of FM Waveform Linearity

(1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.

(2) Playing the alignment tape MHP, observe the FM waveform.

(3) Press the channel buttons (+) and (–) buttons simultaneously during playback to enter the manual tracking mode (This also brings tracking to the center.)

(4) Make sure that there is no significant level drop of the FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (Fig.2-4-1)

(5) Slightly loosen the set screw under the pole base assembly with a 1.25 mm hexagonal wrench (Take care not to loosen too much). (Fig.2-4-2)

(6) Reduce the FM waveform while pressing the channel buttons (+, –) during playback. If a drop in level is found on the left side as shown in Fig.2-4-3, turn the guide roller of the pole base assembly (supply side) with the roller driver (PTU94002) to make the FM waveform linear.
If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the guide roller to make it linear. (Fig.2-4-3)

(7) Then play MHP-L and make sure that the FM waveform varies in parallel and linearly with the tracking operation. When required, perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).

(8) After adjustment, tighten the set screw under the pole base assembly. (Take care not to tighten too much)

(9) After tightening the set screw, play the alignment tape MHP and MHP-L again to make sure that the FM waveform has correct variation.

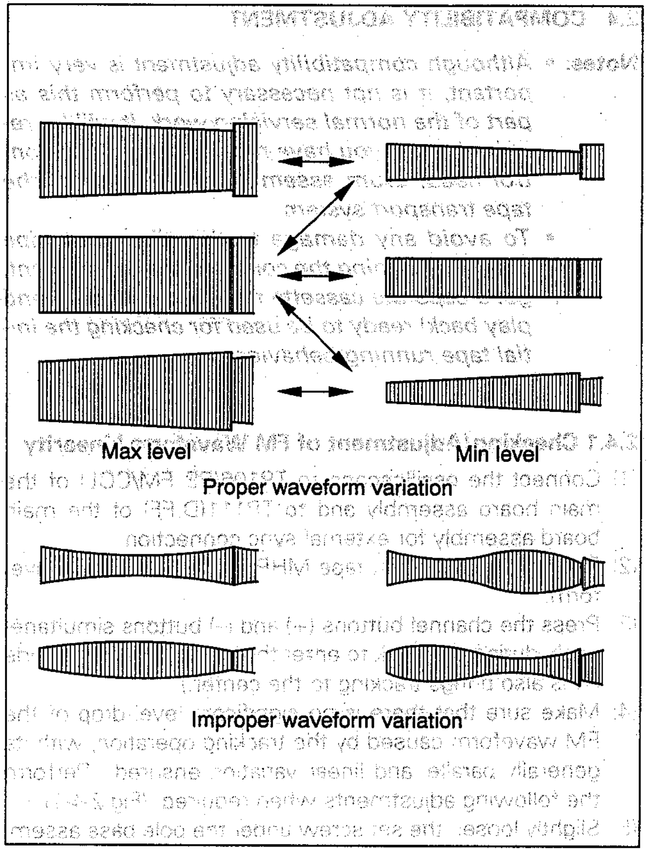

Max level
Min level
Proper waveform variation
Improper waveform variation

Fig. 2-4-1

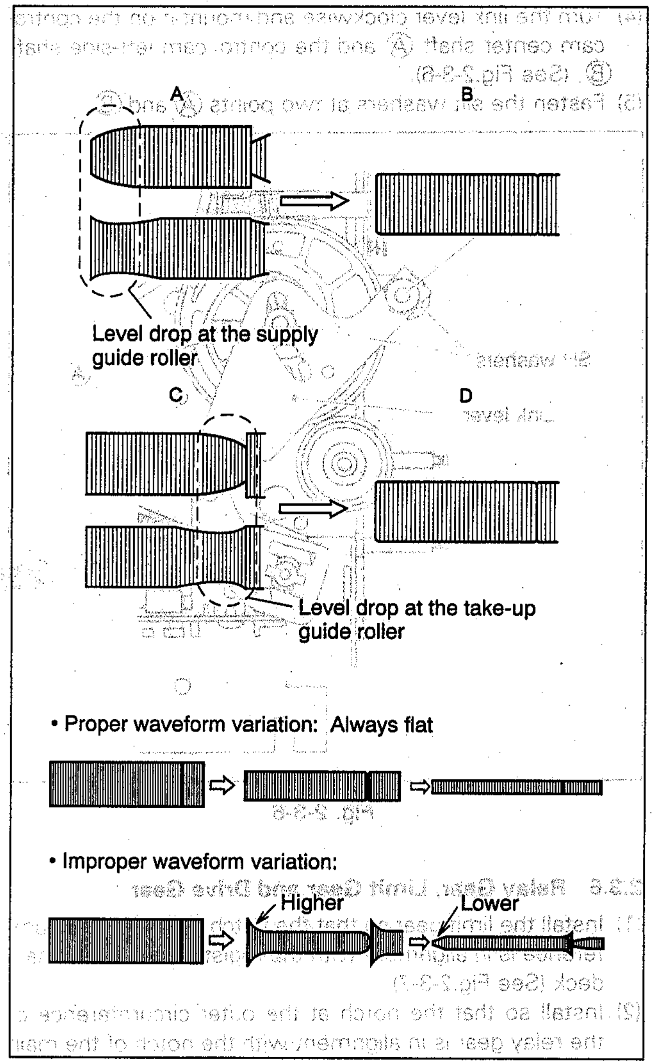

A
B
Level drop at the supply guide roller
C
D
Level drop at the take-up guide roller
• Proper waveform variation: Always flat
• Improper waveform variation:
Higher
Lower

Fig. 2-4-3

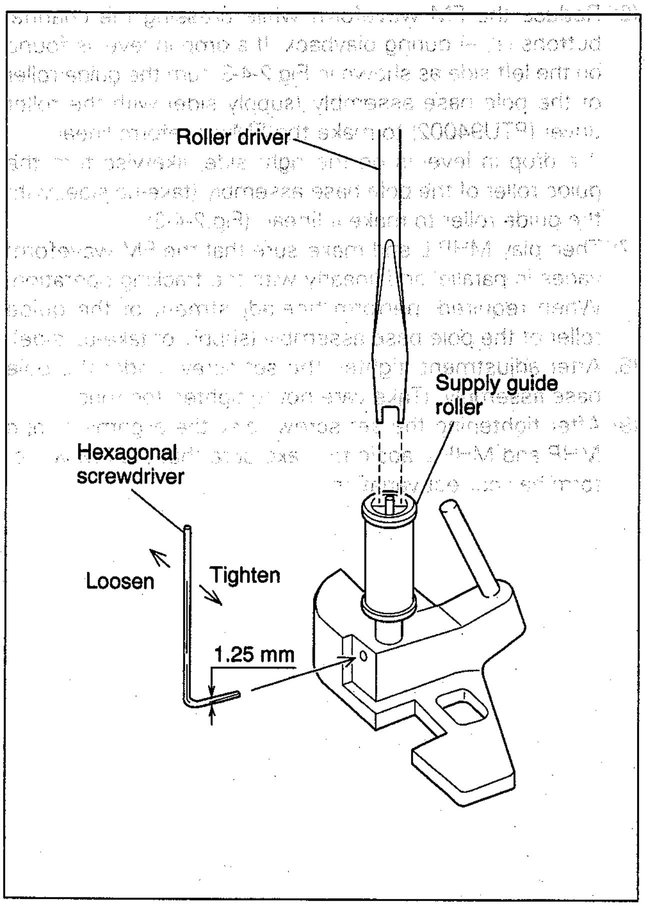
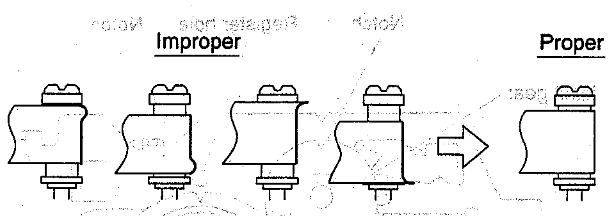
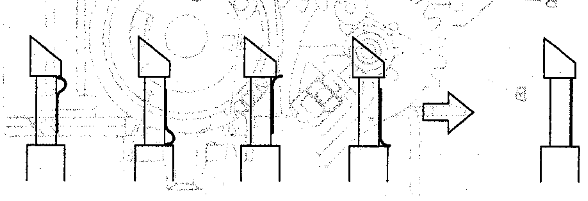

Roller driver
Supply guide roller
Hexagonal screwdriver
Loosen
Tighten
1.25 mm

Fig. 2-4-2


Improper
Proper

(a) Guide roller



(b) Guide pole

Fig. 2-4-4

2.4.2 Checking/Adjustment of the Height and Tilt of the Audio Control Head

Note: *Set a temporary level of the height of the A/C head in advance to make the adjustment easier. (See Fig.2-2-14)*

(1) Connect CH-1 of the oscilloscope to AUDIO OUT and CH-2 to TP4001 (CTL P) of the main board and observe the waveforms on both channels in the ALT mode.

(2) Play the alignment tape MHP and adjust it by turning screws (1), (2) and (3) little by little until the waveform of both the audio output signal and the control pulse reach maximum. Screw (1) and screw (3) are for adjustment of tilt and screw (2) for azimuth.

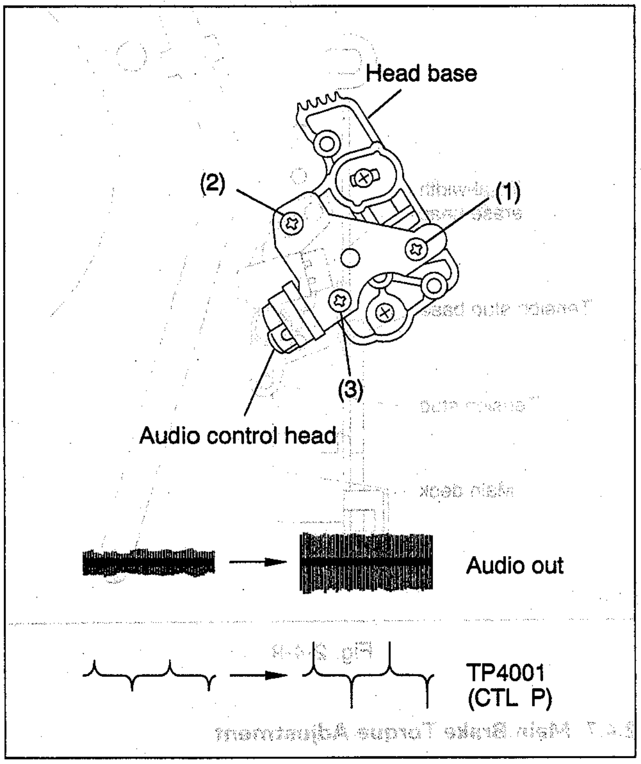


Fig. 2-4-5

2.4.3 Checking/Adjustment of the Audio Control Head Phase (X-Value)

(1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.

(2) Play the alignment tape MHP and observe the FM waveforms.

(3) Press the channel buttons (+) and (–) buttons simultaneously during playback to enter the manual tracking mode (This also brings tracking to the center.)

(4) Loosen screws (4) and (5) so that the A/C head position bit (PTU94010) is set as indicated in Fig.2-4-6.

(5) Turn the A/C head position and first move the audio control head fully up to the capstan head. Then gradually return the audio control head toward the drum and stop it where the FM waveform reaches its maximum for the first time. Then tighten screw (4) temporarily.

(6) Then play the alignment tape MHP-L.

(7) Press the channel buttons (+) and (–) buttons simultaneously during playback to enter the manual tracking mode (This also brings the tracking to the center.)

(8) Perform the tracking operation and make sure that the FM waveform is at its maximum.

(9) If it is not at maximum, loosen the temporarily tightened screw (4) and turn the A/C head position bit to bring the audio control head to a position, around where the waveform reaches its maximum for the first time. Then tighten screws (4) and (5).

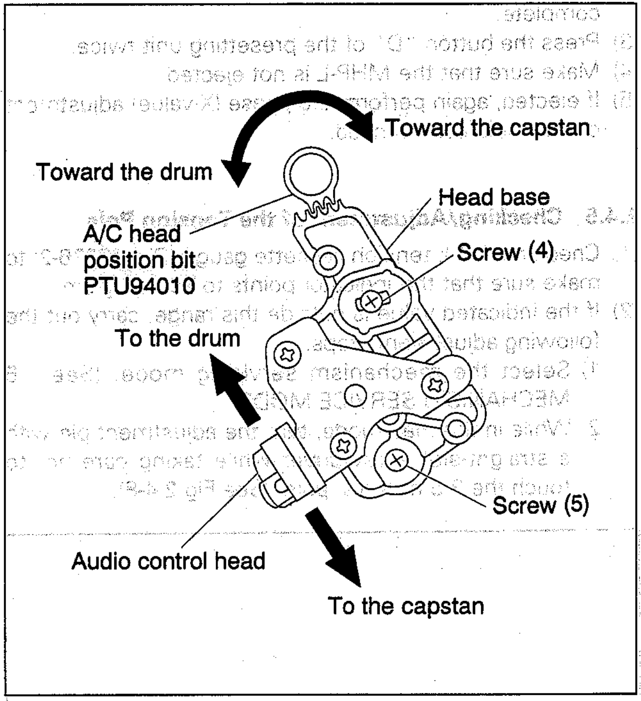


Fig. 2-4-6

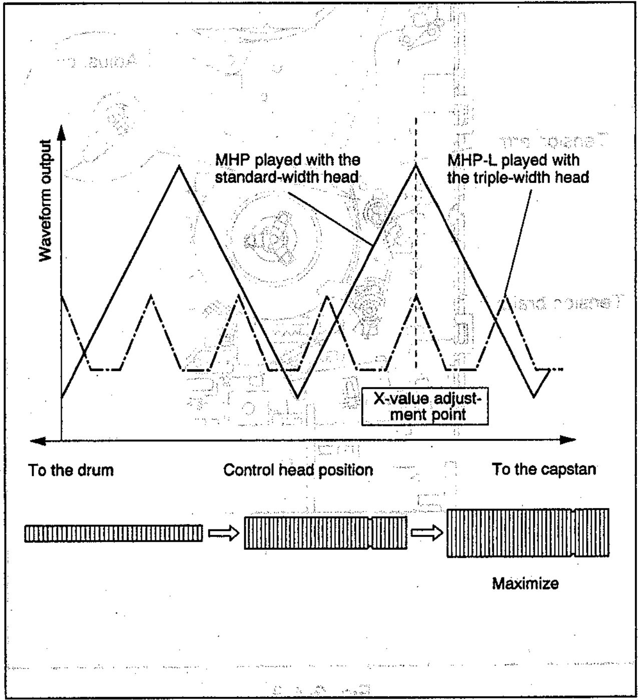


Fig. 2-4-7

2.4.4 Checking the Triple-width Auto Tracking

Note: *Set the remote control cable of the video recorder to A mode.*
(The unit set in B mode does not accept the remote control cable of the presetting unit.)

(1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Playing the alignment tape MH-L and observing the FM waveform, make sure that the auto tracking operation is complete.
(3) Press the button "D" of the presetting unit twice.
(4) Make sure that the MHP-L is not ejected.
(5) If ejected, again perform the phase (X-value) adjustment of the audio control head.

2.4.5 Checking/Adjustment of the Tension Pole

(1) Check the back tension cassette gauge (PUJ48076-2) to make sure that the indicator points to 29 - 46 g-cm.
(2) If the indicated value is outside this range, carry out the following adjustment steps.
   1) Select the mechanism servicing mode. (See 1.5 MECHANISM SERVICE MODE)
   2) While in the Play mode, turn the adjustment pin with a straight-slot screwdriver while taking care not to touch the 2.5 mm dia. pole. (See Fig.2-4-8).

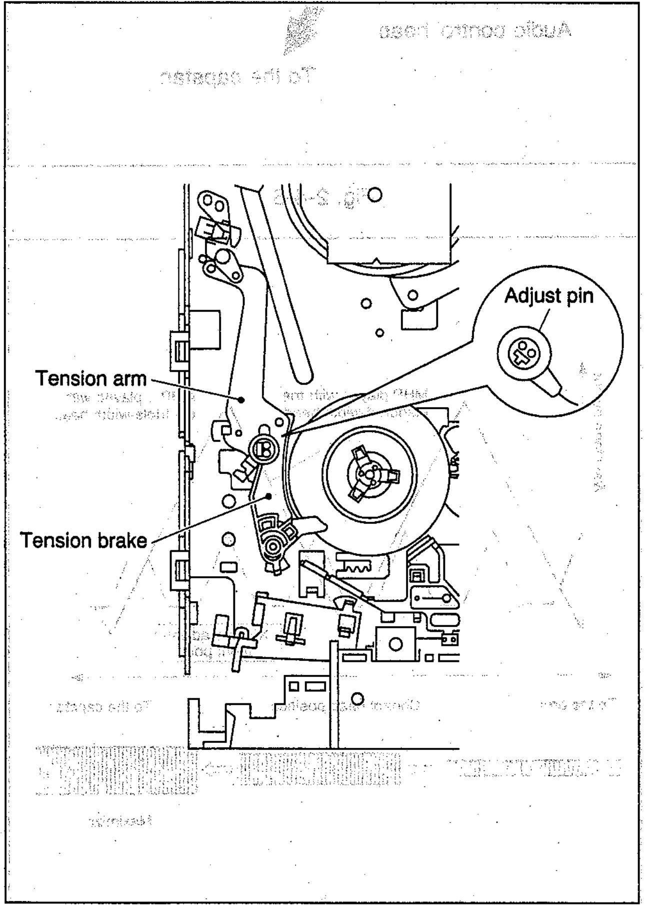


Fig. 2-4-8

2.4.6 Adjustment of the Tension Stud

(1) Adjust so that the left side of the tension stud is on the extension of the notch line of the main deck as indicated in Fig.2-4-9.

Note: *Adjustment is not usually necessary for the tension stud. Perform this adjustment only when it is out of position.*

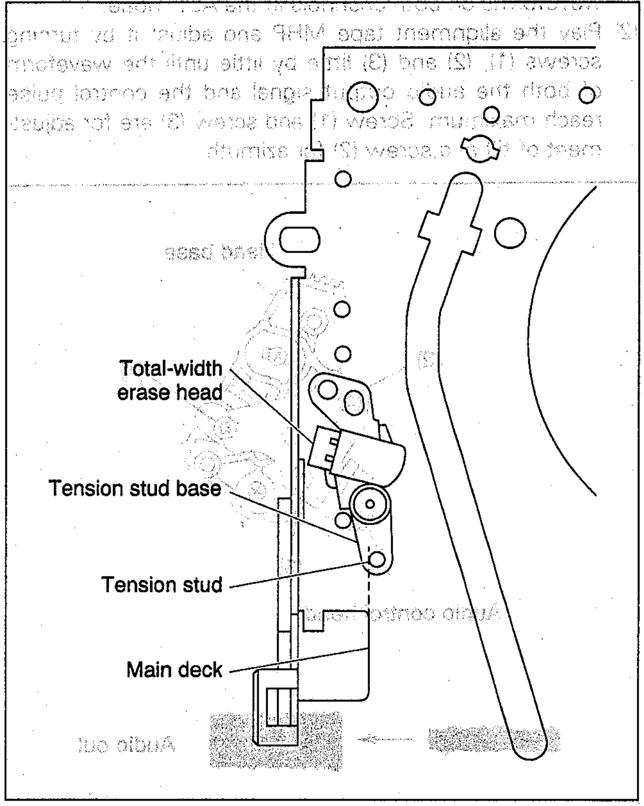


Fig. 2-4-9

2.4.7 Main Brake Torque Adjustment

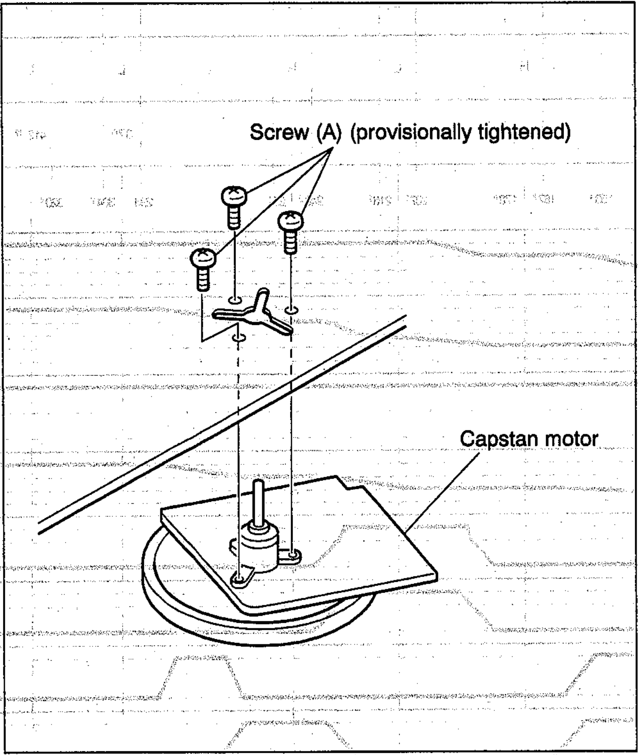
Note: Adjustment of the main brake torque is required after the adjustment pin has been removed or the main brake or the reel base on the supply or take-up side have been replaced, removed or attached.

(1) Rotate the pulley of the loading motor by hand to align the mark ▼ on the loading arm gear shaft with the ST marking on the control plate (i.e. set to the STOP mode position).
(2) Insert a torque gauge (PUJ48075-2) into the reel base on the side to be played, hold the torque gauge lightly, rotate it clockwise when measuring the supply side torque or counterclockwise when measuring the take-up side torque, and read the value indicated at the moment the reel base starts to slip.
(3) Make sure that the main brake torque values on the supply and take-up sides are both between $39.^{2}$ — $78.^{4}$ x 10^{-3} N-m (400 — 800 gf-cm). If the value is outside the specified range, adjust to the specified value by rotating the adjustment pin.
If an adjustment by using the adjustment pin is not possible, replace the main brake.

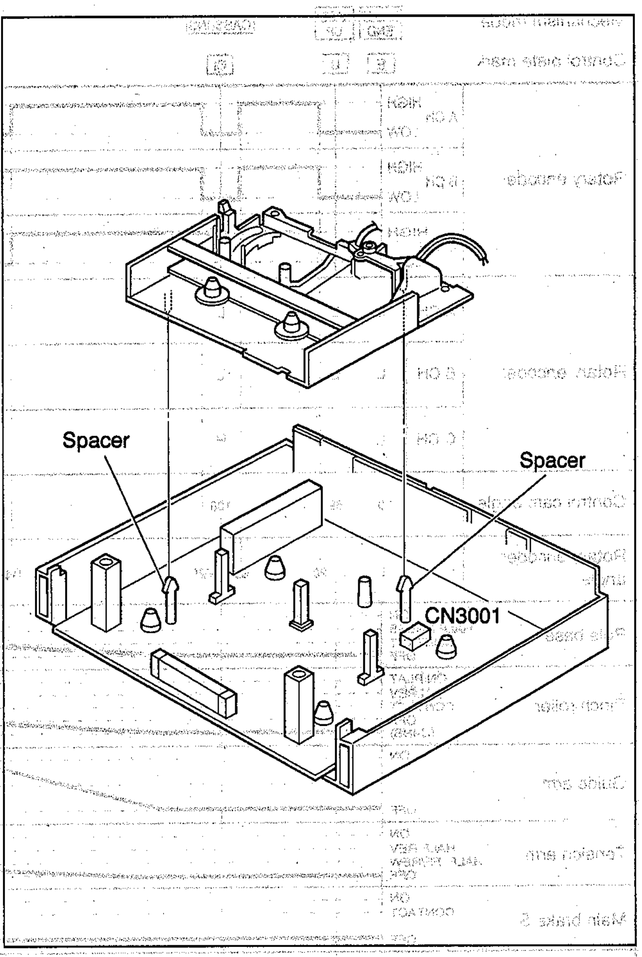
How to Mount the Capstan Motor (Centering the Mounting Position)

When the capstan motor has once been removed and then reinstalled out of the initial correct position in the rotational direction, the capstan motor current may be unstable during operation in high or low temperatures. This may result in greater Wow & Flutter and occasionally in power breakdown because of current over - load. Install the capstan motor while following the procedure given below.
(The capstan motor is centrally located when the unit is shipped from the factory.)

1. Provisionally tighten the three screws (A) securing the capstan motor.



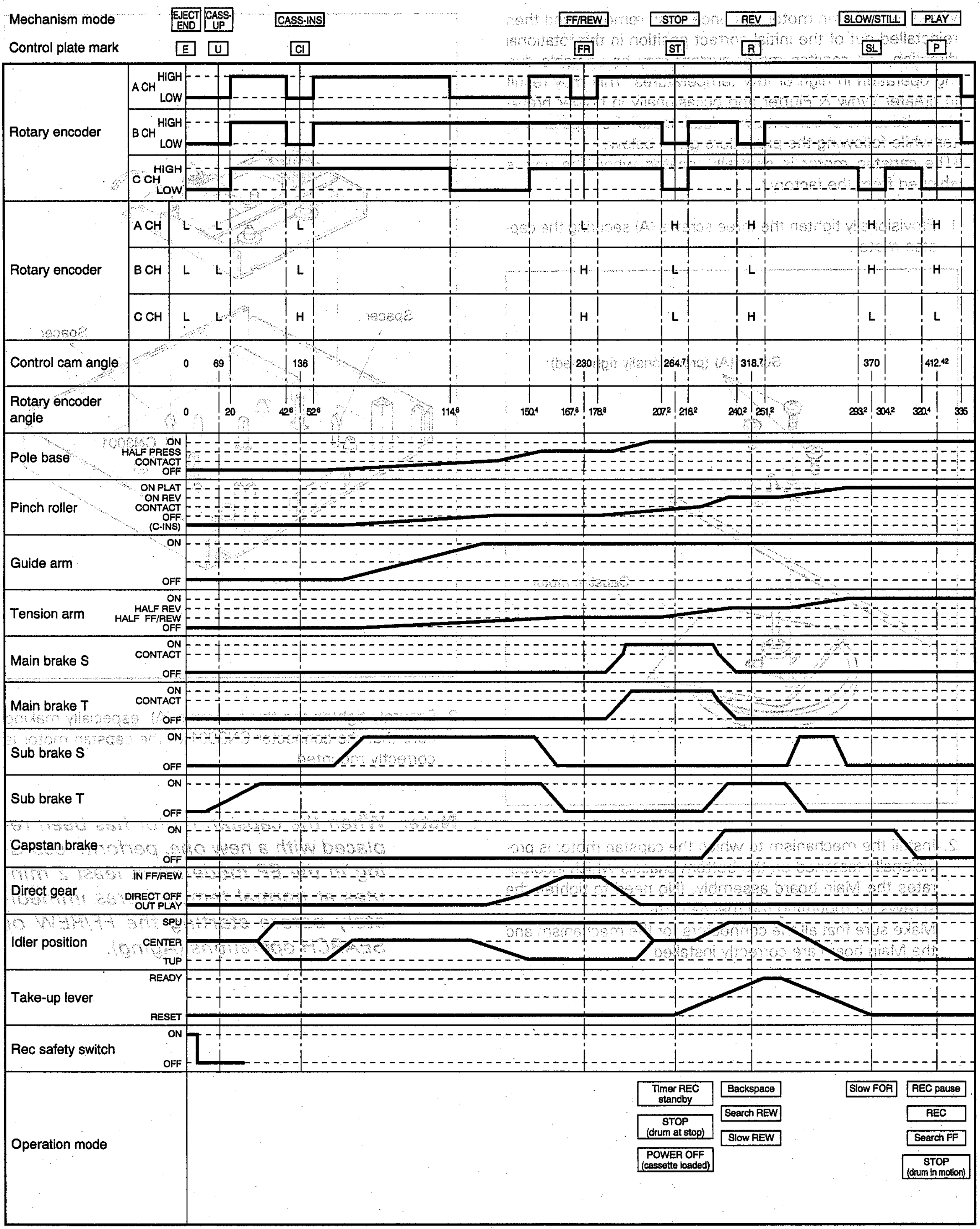
2. Install the mechanism to which the capstan motor is provisionally fastened on the bottom chassis which incorporates the Main board assembly. (No need to tighten the screws for mounting the mechanism)
   Make sure that all the connectors for the mechanism and the Main board are correctly installed.



3. Securely tighten the three screws (A), especially making sure that the connector CN3001 of the capstan motor is correctly mounted.

Note: ***When the capstan motor has been replaced with a new one, perform recording in the EP mode for at least 2 minutes at normal temperatures immediately before starting the FF/REW or SEARCH operations (Aging).***

Mechanism Timing Chart


Mechanism mode
EJECT END
CASS-UP
CASS-INS
FF/REW
STOP
REV
SLOW/STILL
PLAY
Control plate mark
E
U
CI
FR
ST
R
SL
P
Rotary encoder
A CH
B CH
C CH
HIGH
LOW
Rotary encoder
A CH L L L L H H H H
B CH L L L H L L H H
C CH L L H H L H L L
Control cam angle
0
69
136
230
264.7
318.7
370
412.42
Rotary encoder angle
0
20
42.6
52.6
114.6
150.4
167.8
178.8
207.2
218.2
240.2
251.2
293.2
304.2
320.4
335
Pole base
ON
HALF PRESS
CONTACT
OFF
Pinch roller
ON PLAT
ON REV
CONTACT
OFF (C-INS)
Guide arm
ON
OFF
Tension arm
ON
HALF REV
HALF FF/REW
OFF
Main brake S
ON
CONTACT
OFF
Main brake T
ON
CONTACT
OFF
Sub brake S
ON
OFF
Sub brake T
ON
OFF
Capstan brake
ON
OFF
Direct gear
IN FF/REW
DIRECT OFF
OUT PLAY
Idler position
SPU
CENTER
TUP
Take-up lever
READY
RESET
Rec safety switch
ON
OFF
Operation mode
Timer REC standby
STOP (drum at stop)
POWER OFF (cassette loaded)
Backspace
Search REW
Slow REW
Slow FOR
REC pause
REC
Search FF
STOP (drum in motion)

SECTION 3
ELECTRICAL ADJUSTMENT

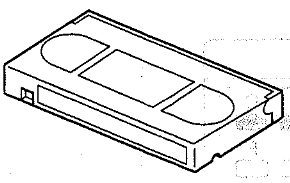
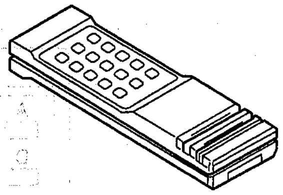
3.1 PRECAUTION

Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also do not attempt these adjustments unless the proper equipments is available.

3.1.1 Required test equipment

① Color television or monitor
② Oscilloscope: wide-band,dual-trace,triggered delayed sweep
③ Frequency counter
④ Digital voltmeter
⑤ Signal generator: RF/IF sweep/maker
⑥ Signal generator: NTSC color bar, stairstep
⑦ Recording tape
⑧ Digit-key remote controller(provided)

3.1.2 Required adjustment tools

Alignment tape (SP,stairstep) MHP	Presetting unit PTU94008
	

3.1.3 Color bar signal,color bar pattern

- Color bar signal

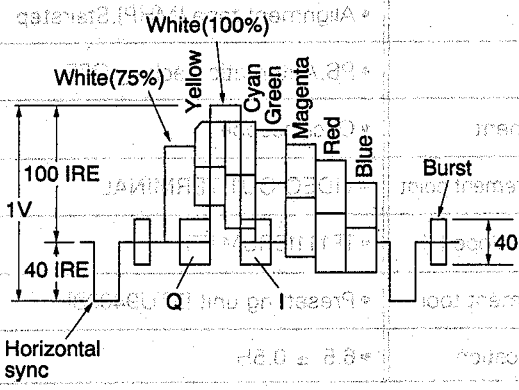

White(100%)
White(75%)
Yellow
Cyan
Green
Magenta
Red
Blue
100 IRE
1V
40 IRE
Burst
40 IRE
Q
I
Horizontal sync

Fig. 3-1-1 Color bar signal waveform

- Color bar pattern

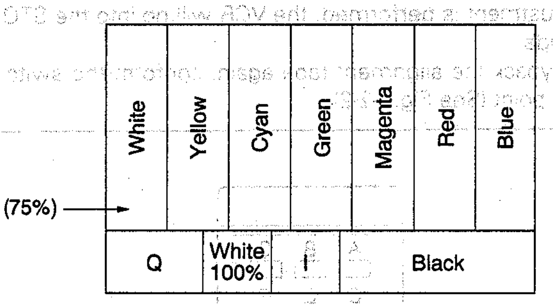

White
Yellow
Cyan
Green
Magenta
Red
Blue
(75%)
Q
White 100%
I
Black

Fig. 3-1-2 Color bar pattern

Note:

Be sure to remove R3236 (MAIN PWB ASS'Y) when replacing the system controller IC (MAIN PWB ASS'Y IC3001) and the EEPROM (MAIN PWB ASS'Y IC3004).

3.2 SERVO CIRCUIT

Notes:
- *Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.*
- *Set VCR to the mode A by remote controller.*

3.2.1 PB switching point

Signal	• Alignment tape [MHP], Stairstep
Mode	• PB, Automatic tracking OFF
Equipment	• Oscilloscope
Measurement point	• VIDEO OUT TERMINAL
Trigger slope (–)	• TP111(DRUM FF)
Adjustment tool	• Presetting unit [PTU94008]
Specification	• 6.5 ± 0.5H

(1) Connect an oscilloscope to VIDEO OUT TERMINAL and external trigger from TP111 (negative slope).
(2) Playback the stairstep signal of the alignment tape.
(3) Press the "O" button of the presetting unit.
The adjustment is performed automatically. Once the adjustment is performed, the VCR will go into the STOP mode.
(4) Playback the alignment tape again, conform the switching point (See Fig.3-2-2).

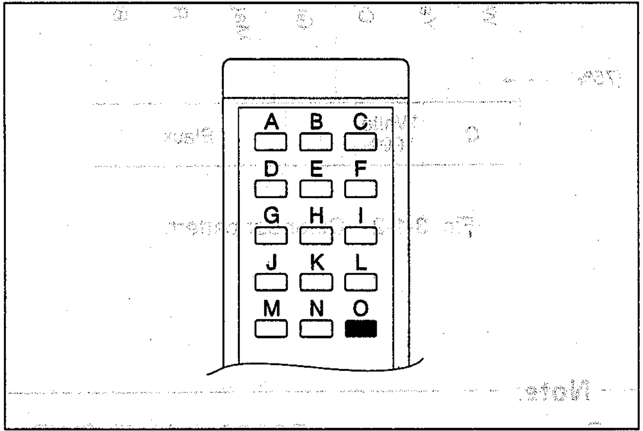


Fig. 3-2-1 Presetting unit

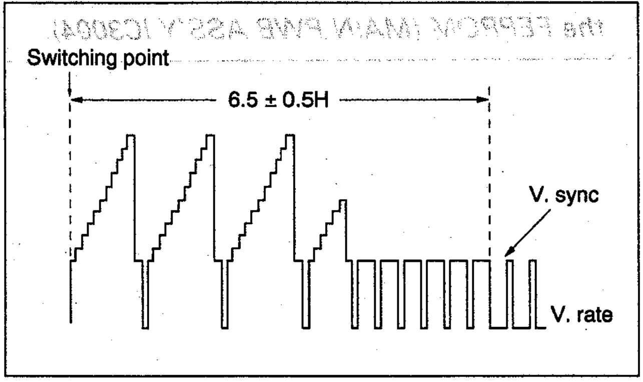


Fig. 3-2-2 PB switching point

3.2.2 Slow tracking preset

Signal	• Tuner or color bar
Mode	• SP/EP, REC → PB(SLOW) Automatic tracking OFF
Equipment	• TV-Monitor
Adjustment tool	• Presetting unit [PTU94008]
Specification	• Minimum noise

Note : *Set VCR to the mode A by remote controller. Use only buttons "B" and "C", depressing other buttons during adjustment may cause adjustment errors.*

(1) Record a color bar signal in the SP mode.
(2) Playback recorded signal on the FWD slow mode.
(3) Set the tracking control to the center position by simultaneously pressing the CH "▲" and "▼" buttons.
(4) Observe the display on the TV monitor and adjust for optimum noise condition (best tracking) by depressing "B " or "C " buttons of the presetting unit.
(5) Depress the STOP button.
(6) Confirm that the bar noise is not visible on the TV monitor in the slow mode.
(7) Repeat steps (2) to (6) in REV slow mode.
(8) Repeat steps (1) to (7) in EP mode.

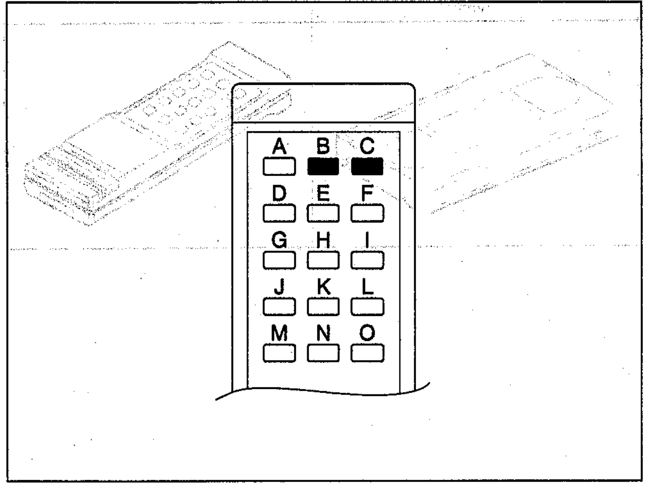


Fig. 3-2-3 Presetting unit

3.3 DEMODULATOR CIRCUIT

Notes:
- *Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.*
- *DEMODULATOR circuit adjustments are preformed by the EVR system by use of the presetting unit and digit-key remote controller.*
- *Unless otherwise specified,set an audio multiplex TV signal generator as follows;*
  RF signal : 70 dbu / 75 Ω,color bar 87.5% modulation.
- *Set VCR to the mode A by remote controller.*

3.3.1 Input level

Signal	• RF signal
Mode	• EE Tuner
Equipment	• Audio level meter
Measurement point	• IC6501 - pin 26
Adjustment tool	• Presetting unit [PTU94008], Digit-key remote controller
EVR mode	• A : 20
Specification	• 500 ± 10 mVrms

(1) Connect an audio level meter to IC6501 - pin 26.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 3 seconds.
(3) Set "A : 20" pressing 2 and 0 digit keys of the remote controller.
(4) Set a signal generator mode to mono 300Hz.
(5) Adjust CH " ▲ " or " ▼ " button for 500 ± 10 mVrms.
(6) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.3.2 Stereo VCO

Signal	• No signal
Mode	• EE Tuner
Equipment	• Frequency counter
Measurement point	• IC6501 - pin 26
Adjustment tool	• Presetting unit [PTU94008], Digit-key remote controller
EVR mode	• A : 21
Specification	• 15.73 ± 0.1 KHz

(1) Connect a frequency counter to IC6501 - pin 26.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 3 seconds.
(3) Set "A : 21" pressing 2 and 1digit keys of the remote controller.
(4) Adjust CH " ▲ " or " ▼ " button for 15.73 ± 0.1 KHz.
(5) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.3.3 Stereo filter

Signal	• RF signal
Mode	• EE Tuner
Equipment	• Oscilloscope
Measurement point	• IC6501 - pin 26
Adjustment tool	• Presetting unit [PTU94008], Digit-key remote controller
EVR mode	• A : 22
Specification	• Minimun level

(1) Connect an oscilloscope to IC6501 - pin 26.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 3 seconds.
(3) Set "A : 22" pressing 2digit key twice of the remote controller.
(4) Adjust CH " ▲ " or " ▼ " button for minimum level.
(5) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.3.4 Separation - 1

Signal	• RF signal
Mode	• EE Tuner
Equipment	• Audio level meter
Measurement point	• IC6501 - pin 26
Adjustment tool	• Presetting unit [PTU94008], Digit-key remote controller
EVR mode	• A : 23
Specification	• Minimum level

(1) Connect an audio level meter to IC6501 - pin 26.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 3 seconds.
(3) Set "A : 23" pressing 2 and 3 digit keys of the remote controller.
(4) Set a signal generator mode to alternate L-ch 300Hz 14% modulated.
(5) Adjust CH " ▲ " or " ▼ " button for minimum level.
(6) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.3.5 Separation - 2

Signal	• RF signal
Mode	• EE Tuner
Equipment	• Audio level meter
Measurement point	• IC6501- pin 26
Adjustment tool	• Presetting unit [PTU94008], Digit-key remote controller
EVR mode	• A : 24
Specification	• Minimum level

(1) Connect an audio level meter to IC6501- pin 26.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 3 seconds.
(3) Set "A : 24" pressing 2 and 4 digit keys of the remote controller.
(4) Set a signal generator mode to alternate L-ch 5Hz 14% modulated.
(5) Adjust CH "▲" or "▼" button for minimum level.
(6) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.3.6 SAP VCO

Signal	• No signal
Mode	• EE Tuner
Equipment	• Frequency counter
Measurement point	• IC6501- pin 26
Adjustment tool	• Presetting unit [PTU94008], Digit-key remote controller
EVR mode	• A : 25
Specification	• 78.67 ± 0.5 KHz

(1) Connect a frequency counter to IC6501- pin 26.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 3 seconds.
(3) Set "A : 25" pressing 2 and 5 digit keys of the remote controller.
(4) Adjust CH "▲" or "▼" button for 78.67 ± 0.5 KHz.
(5) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.4 VIDEO CIRCUIT

Notes: • *Unless oterwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.*
• *Set VCR to the mode A by remote controller.*

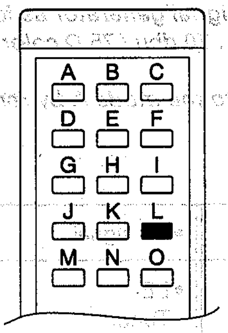


Fig. 3-4-1 Presetting unit

3.4.1 Auto picture

Signal	• Monoscope
Mode	• Auto picture : OFF • REC then PB • SP/EP
Adjustment tool	• Presetting unit[PTU94008]
Specification	• STOP mode

(1) Record a monoscope signal in the SP mode.
(2) Playback the recorded signal.
(3) Press the "L" button of the presetting unit during playback.
(4) Confirm that VCR will go into the STOP mode.
(5) Repeat steps (2) to (4) in the EP mode.

3.5 ON SCREEN CIRCUIT

Notes: • *Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.*
• *Set VCR to the mode A by remote controller.*

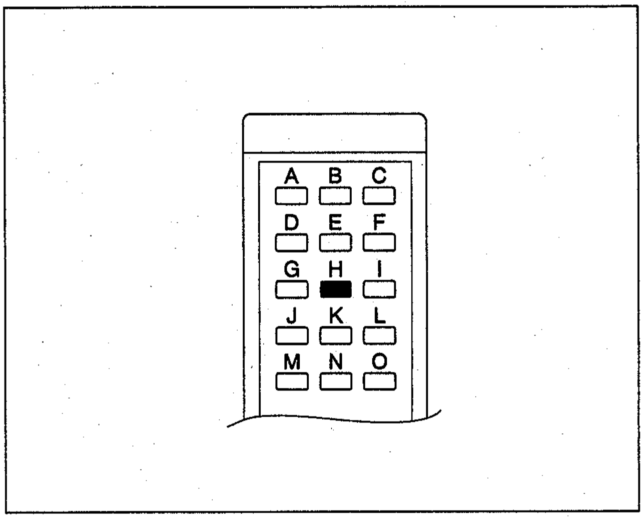

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O

Fig.3-5-1 Presetting unit

3.5.1 Character position

Signal	• No signal
Mode	• EE
Equipment	• TV-monitor
Adjustment tool	• Presetting unit
Specification	• Character centre

(1) Press the MENU button and display the on screen character.
(2) Press "H" button on the presetting unit.
(3) Adjust CH "▲" or "▼" button so that the character is centre position.
(4) Press the OK button on remote controller to change the indications of "0E" and "0F" on the FDP.
(5) Press "H" button on the presetting unit again to return to normal mode.

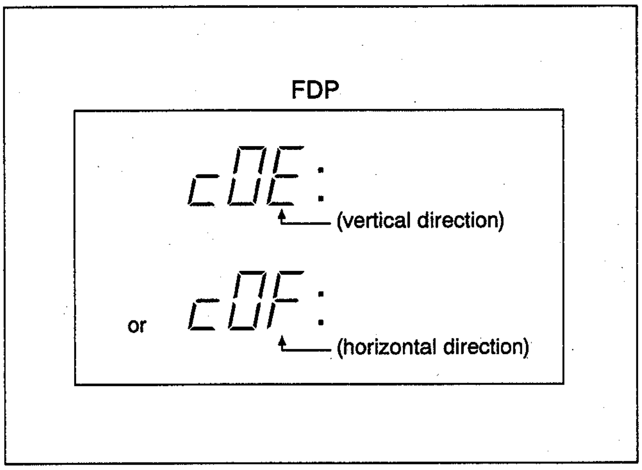

FDP
c0E:
(vertical direction)
or
c0F:
(horizontal direction)

Fig.3-5-2 FDP

SECTION 4
CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions
The Components identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.

1. Units of components on the schematic diagram

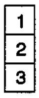
Unless otherwise specified.

1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).
   Chip resistors are 1/16 W.
   K: KΩ (1000Ω), M: MΩ (1000KΩ)
2) All capacitance values are in µF, (P: PF).
3) All inductance values are in µH, (m: mH).
4) All diodes are 1SS133, MA165 or IN4148M (refer to parts list).

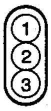
2. Indications of control voltage

AUX : Active at high
AUX or AUX(L) : Active at low

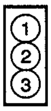
3. Interpreting Connector indications



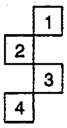
Removable connector



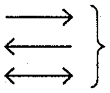
Wire soldered directly on board



Non-removable Board connector



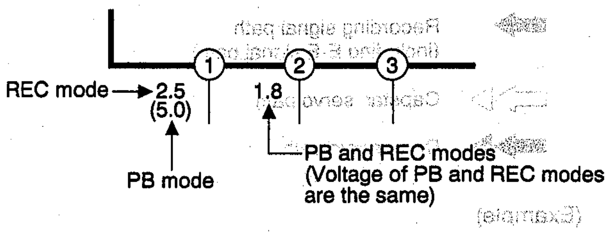
Board to Board



Connected pattern on board
The arrows indicate signal path

4. Voltage measurement

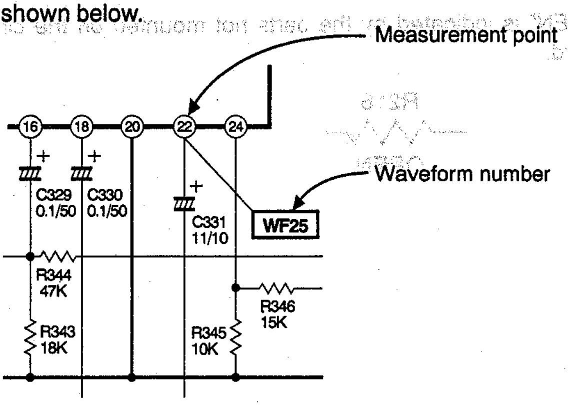
1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
   — : Unmeasurable or unnecessary to measure
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, Normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode
4) Indication on schematic diagram
   Voltage Indications for REC and PB mode on the schematic diagram are as shown below.


REC mode
2.5
(5.0)
1
2
3
1.8
PB mode
PB and REC modes
(Voltage of PB and REC modes are the same)

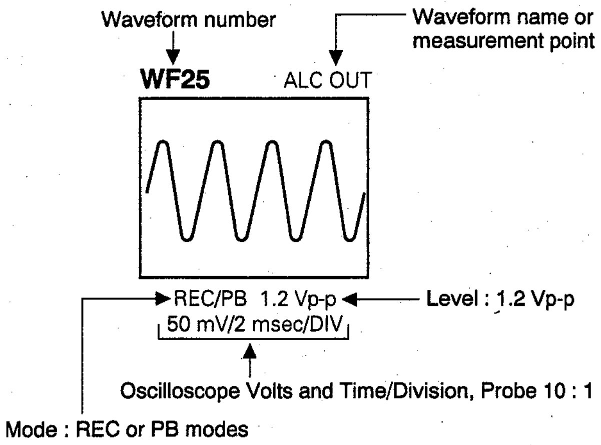
Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test chatrs in the E-E mode
4) Indication on schematic diagram
   Waveform indications on the schematic diagram are as shown below.


Measurement point
16
18
20
22
24
C329
0.1/50
C330
0.1/50
C331
11/10
WF25
Waveform number
R344
47K
R343
18K
R345
10K
R346
15K

5) Waveform indications


Waveform number
Waveform name or measurement point
WF25
ALC OUT
REC/PB 1.2 Vp-p
Level : 1.2 Vp-p
50 mV/2 msec/DIV
Oscilloscope Volts and Time/Division, Probe 10 : 1
Mode : REC or PB modes

6. Signal path Symbols

The arrows indicate the signal path as follows.

⇨ Playback signal path

➡ Playback and recording signal path

➡ Recording signal path (including E-E signal path)

⇨▷ Capstan servo path

➡▶ Drum servo path

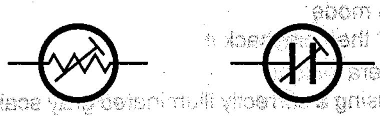
(Example)

R-Y ⇨ Playback R-Y signal path

Y ➡ Recording Y signal path

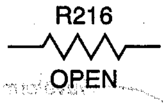
7. Indication of the parts for adjustments

The parts for the adjustments are surrounded with the circle as shown below.



8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.



CIRCUIT BOARD NOTES

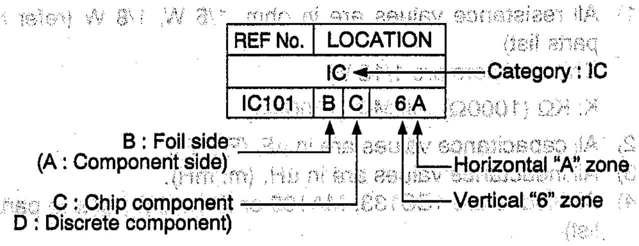
1. Foil and Component sides

1) Foil side (B side) :
Parts on the foil side seen from foil face (pattern face) are indicated.

2) Component side (A side) :
Parts on the component side seen from component face (parts face) indicated.

2. Parts location guides

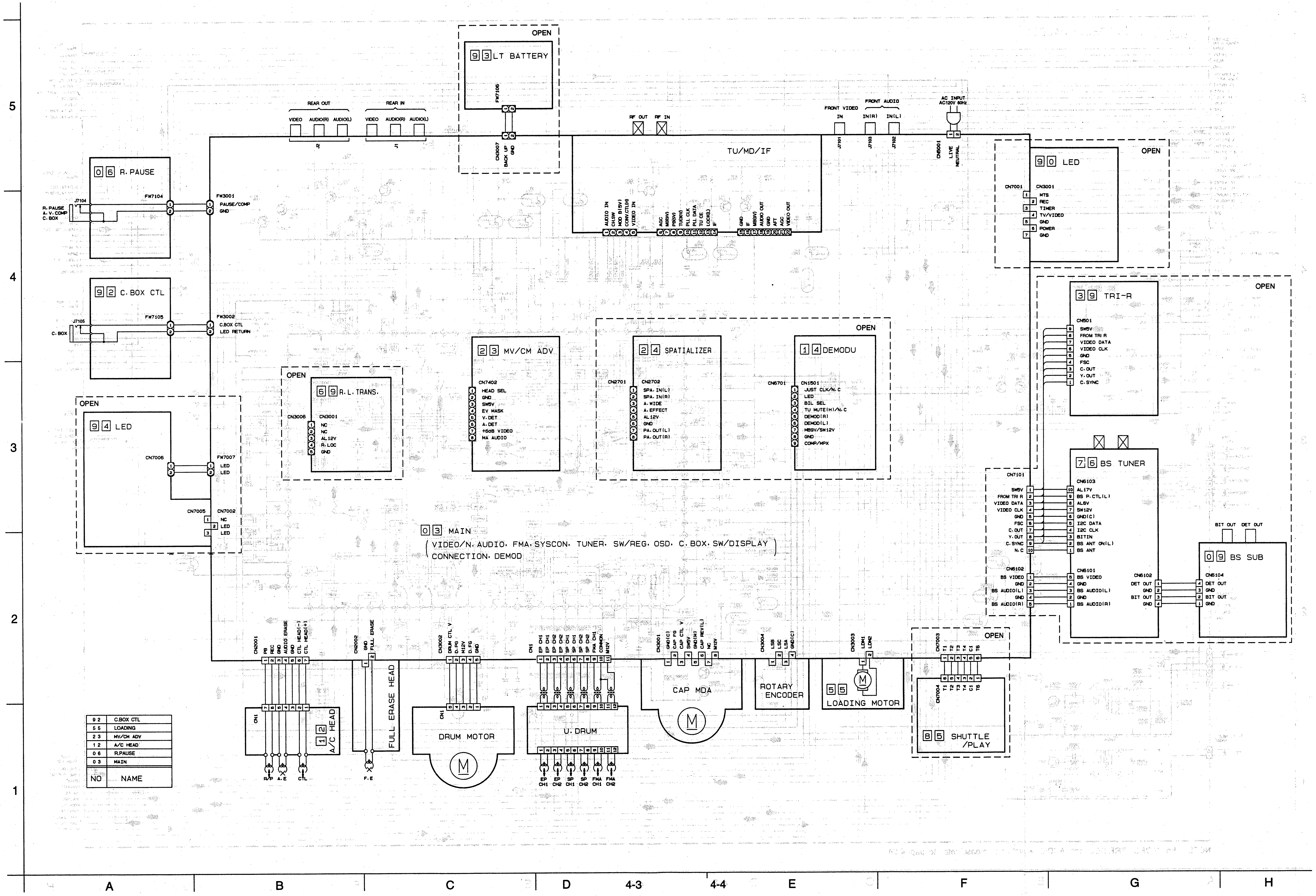
Parts location are indicated by guide scale on the circuit board.


REF No.
LOCATION
IC
Category : IC
IC101
B
C
6 A
B : Foil side
(A : Component side)
C : Chip component
D : Discrete component)
Horizontal "A" zone
Vertical "6" zone

Note:

For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

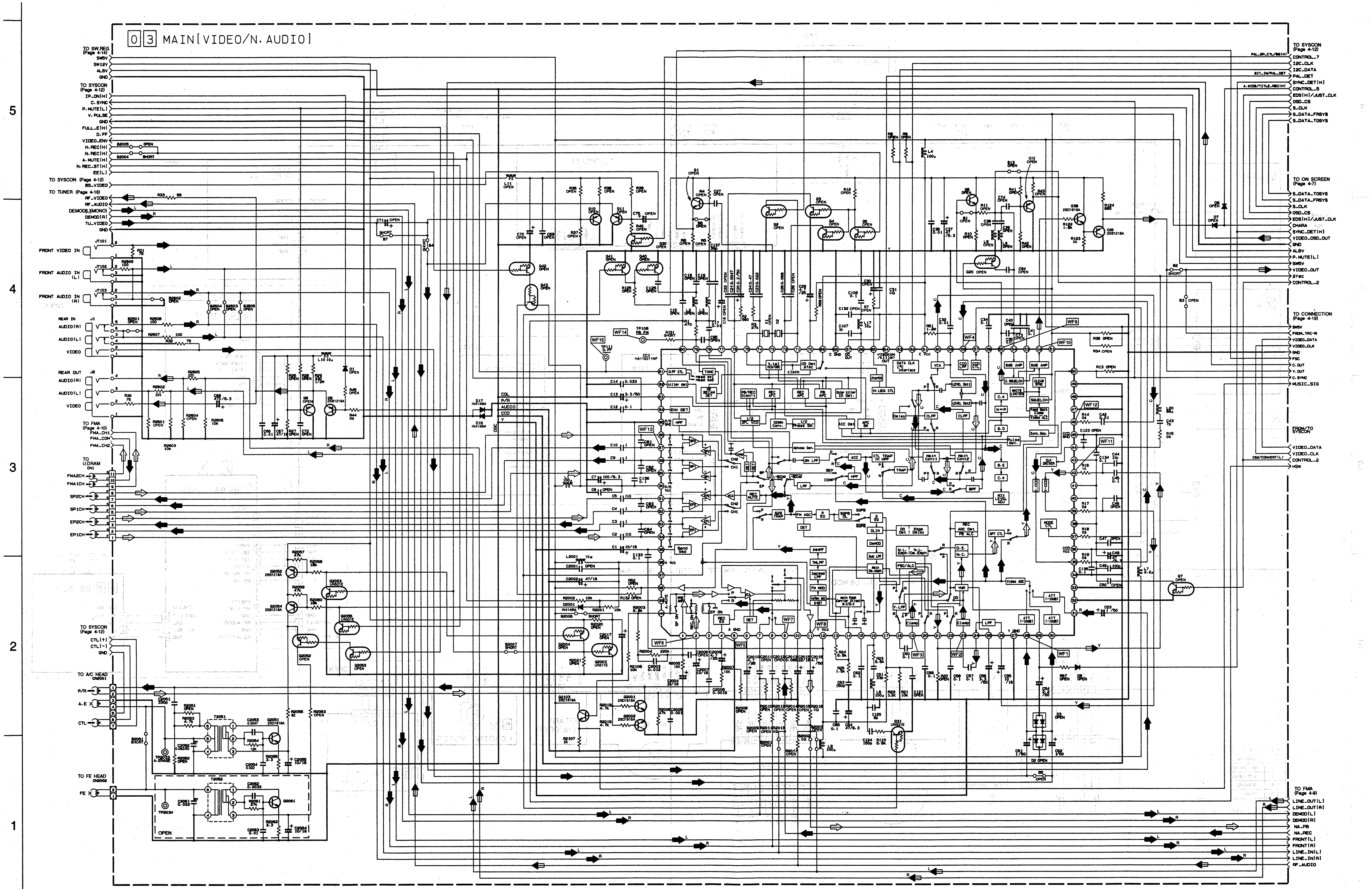
4.1 BOARD INTERCONNECTIONS



5
4
3
2
1
OPEN
9 3 LT BATTERY
FW7106
CN3007
BACK UP
GND
REAR OUT
VIDEO
AUDIO(R)
AUDIO(L)
REAR IN
VIDEO
AUDIO(R)
AUDIO(L)
J2
J1
RF OUT
RF IN
FRONT VIDEO
IN
FRONT AUDIO
IN(R)
IN(L)
J7101
J7103
J7102
AC INPUT
AC120V 60Hz
CN5001
LIVE
NEUTRAL
TU/MD/IF
AUDIO IN
CH.SW
MOD B(5V)
CONV.CTL(H)
VIDEO IN
AGC
MB(9V)
PB(5V)
TU(30V)
PLL CLK
PLL DATA
TU CE
LOCK(L)
IF
GND
IF
MB(9V)
AUDIO OUT
GND
AFT
AGC
VIDEO OUT
0 6 R. PAUSE
J7104
R. PAUSE
A. V. COMP
C. BOX
FW7104
FW3001
PAUSE/COMP
GND
9 2 C. BOX CTL
J7105
C. BOX
FW7105
FW3002
C.BOX CTL
LED RETURN
OPEN
9 4 LED
CN7006
FW7007
LED
LED
CN7005
CN7002
NC
LED
LED
OPEN
6 9 R. L. TRANS.
CN3006
CN3001
NC
NC
AL12V
R. LOC
GND
2 3 MV/CM ADV
CN7402
HEAD SEL
GND
SW5V
EV MASK
V. DET
A. DET
+6dB VIDEO
HA AUDIO
OPEN
2 4 SPATIALIZER
CN2701
CN2702
SPA. IN(L)
SPA. IN(R)
A. WIDE
A. EFFECT
AL12V
GND
PA. OUT(L)
PA. OUT(R)
1 4 DEMODU
CN5701
CN1501
JUST CLK/N. C
LED
BIL SEL
TU MUTE(H)/N. C
DEMOD(R)
DEMOD(L)
MB9V/SW12V
GND
COMP/MPX
0 3 MAIN
(VIDEO/N. AUDIO. FMA. SYSCON. TUNER. SW/REG. OSD. C. BOX. SW/DISPLAY
CONNECTION. DEMOD)
OPEN
9 0 LED
CN7001
CN3001
MTS
REC
TIMER
TV/VIDEO
GND
POWER
GND
OPEN
3 9 TRI-R
CN501
SW5V
FROM TRI R
VIDEO DATA
VIDEO CLK
GND
FSC
C. OUT
Y. OUT
C. SYNC
7 6 BS TUNER
CN7101
SW5V
FROM TRI R
VIDEO DATA
VIDEO CLK
GND
FSC
C. OUT
Y. OUT
C. SYNC
N. C
CN6103
AL17V
BS P. CTL(L)
AL6V
SW12V
GND(C)
I2C DATA
I2C CLK
BITIN
BS ANT ON(L)
BS ANT
CN6102
BS VIDEO
GND
BS AUDIO(L)
GND
BS AUDIO(R)
CN6101
BS VIDEO
GND
BS AUDIO(L)
GND
BS AUDIO(R)
CN6102
DET OUT
GND
BIT OUT
GND
BIT OUT
DET OUT
0 9 BS SUB
CN6104
DET OUT
GND
BIT OUT
GND
CN2001
PB
REC
GND
AUDIO ERASE
GND
CTL HEAD(-)
CTL HEAD(+)
CN1
1 2 A/C HEAD
R/P
A. E
CTL
CN2002
GND
FULL ERASE
FULL ERASE HEAD
F. E
CN3002
DRUM CTL V
D. PG
M12V
D. FG
GND
CN1
DRUM MOTOR
M
CN1
EP CH1
EP CH1
EP CH2
EP CH2
SP CH1
SP CH1
SP CH2
SP CH2
FMA CH1
COMMON
M12V
U. DRUM
EP CH1
EP CH2
SP CH1
SP CH2
FMA CH1
FMA CH2
CN3001
GND(C)
CAP FG
CAP CTL V
SW5V
GND(M)
CAP REV(L)
NC
M12V
CAP MDA
M
CN3004
LSB
LSC
LSA
GND(C)
ROTARY ENCODER
CN3003
LDM1
LDM2
M
5 5 LOADING MOTOR
OPEN
CN7003
T1
T2
T3
T4
C1
T6
CN7004
8 5 SHUTTLE /PLAY
A
B
C
D
4-3
4-4
E
F
G
H

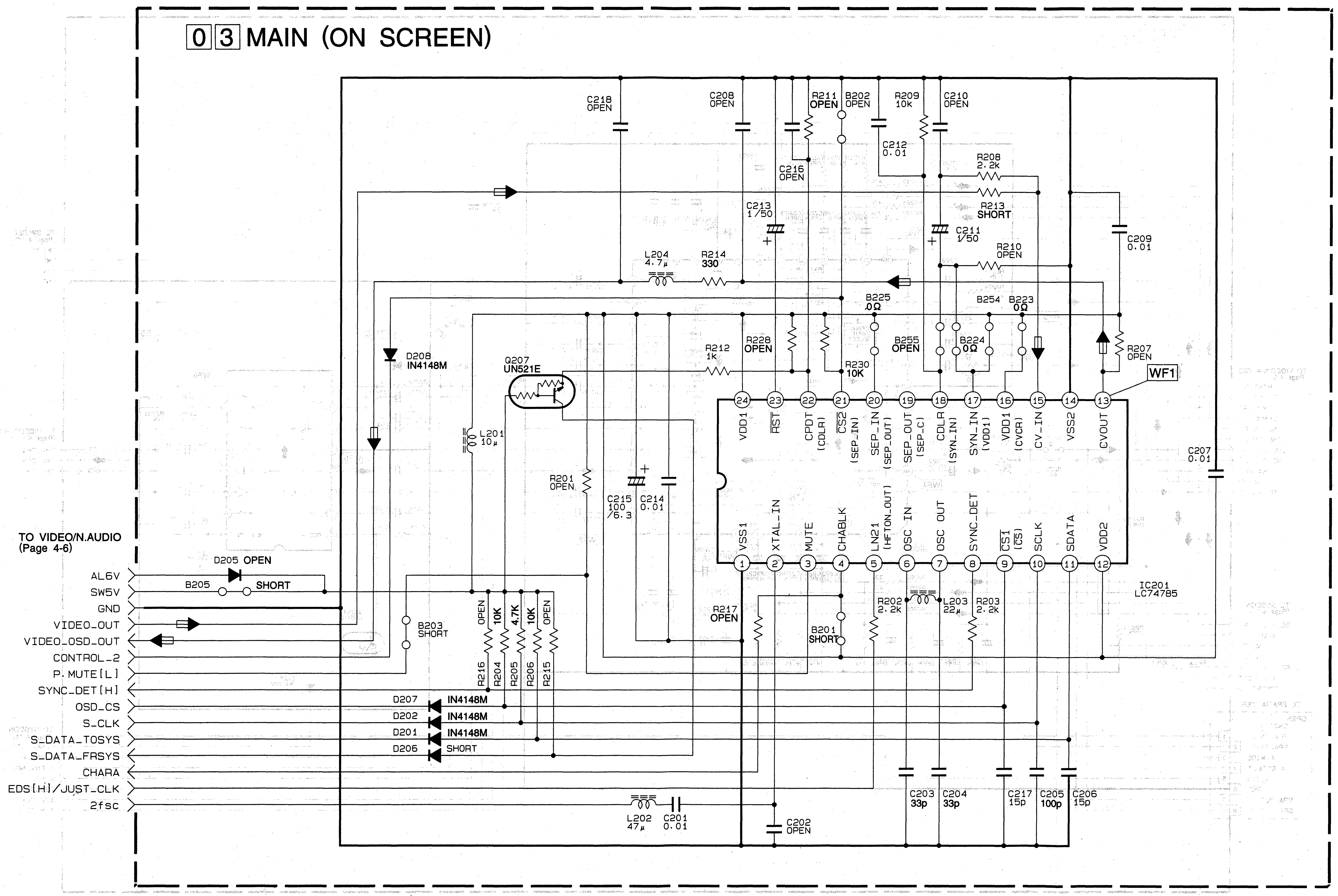
NO	NAME
9 2	C.BOX CTL
5 5	LOADING
2 3	MV/CM ADV
1 2	A/C HEAD
0 6	R.PAUSE
0 3	MAIN

4.2 VIDEO/N.AUDIO SCHEMATIC DIAGRAM


03 MAIN[VIDEO/N.AUDIO]
TO SW.REG (Page 4-14)
SW5V
SW12V
AL6V
GND
TO SYSCON (Page 4-12)
IP_ON[H]
C.SYNC
P.MUTE[L]
V.PULSE
GND
FULL_E[H]
D.FF
VIDEO_ENV
H.REC[H]
N.REC[H]
A.MUTE[H]
N.REC_ST[H]
EE[L]
B2005 OPEN
B2004 SHORT
TO SYSCON (Page 4-12)
BS_VIDEO
TO TUNER (Page 4-16)
RF_VIDEO
RF_AUDIO
DEMOD[L](MONO)
DEMOD[R]
TU_VIDEO
GND
FRONT VIDEO IN
J7101
FRONT AUDIO IN (L)
J7102
FRONT AUDIO IN (R)
J7103
REAR IN
J1
AUDIO(R)
AUDIO(L)
VIDEO
REAR OUT
J2
AUDIO(R)
AUDIO(L)
VIDEO
TO FMA (Page 4-10)
FMA_CH1
FMA_COM
FMA_CH2
TO U.DRAM CN1
FMA2CH
FMA1CH
SP2CH
SP1CH
EP2CH
EP1CH
TO SYSCON (Page 4-12)
CTL(+)
CTL(-)
GND
TO A/C HEAD CN2001
P/R
A.E
CTL
TO FE HEAD CN2002
FE
T2051
T2052
OPEN
IC1 HA118211NF
TO SYSCON (Page 4-12)
PAL_EP_CTL/BS(H)
CONTROL_7
I2C_CLK
I2C_DATA
BIT_IN/PAL_DET
PAL_DET
SYNC_DET[H]
A.WIDE/TITLE_REC(H)
CONTROL_5
EDS[H]/JUST_CLK
OSD_CS
S_CLK
S_DATA_FRSYS
S_DATA_TOSYS
TO ON SCREEN (Page 4-7)
S_DATA_TOSYS
S_DATA_FRSYS
S_CLK
OSD_CS
EDS[H]/JUST_CLK
CHARA
SYNC_DET[H]
VIDEO_OSD_OUT
GND
AL6V
P.MUTE[L]
SW5V
VIDEO_OUT
2fsc
CONTROL_2
TO CONNECTION (Page 4-19)
SW5V
FROM_TRI-R
VIDEO_DATA
VIDEO_CLK
GND
FSC
C.OUT
Y.OUT
C.SYNC
MUSIC_SIG
FROM/TO SYSCON
VIDEO_DATA
VIDEO_CLK
CS2/CONVERT(L)
CONTROL_2
HSW
TO FMA (Page 4-9)
LINE_OUT[L]
LINE_OUT[R]
DEMOD[L]
DEMOD[R]
NA_PB
NA_REC
FRONT[L]
FRONT[R]
LINE_IN[L]
LINE_IN[R]
RF_AUDIO
WF1
WF2
WF3
WF4
WF5
WF6
WF7
WF8
WF9
WF10
WF11
WF12
WF13
WF14
WF15
5
4
3
2
1
A
B
C
D
E
F
G
H

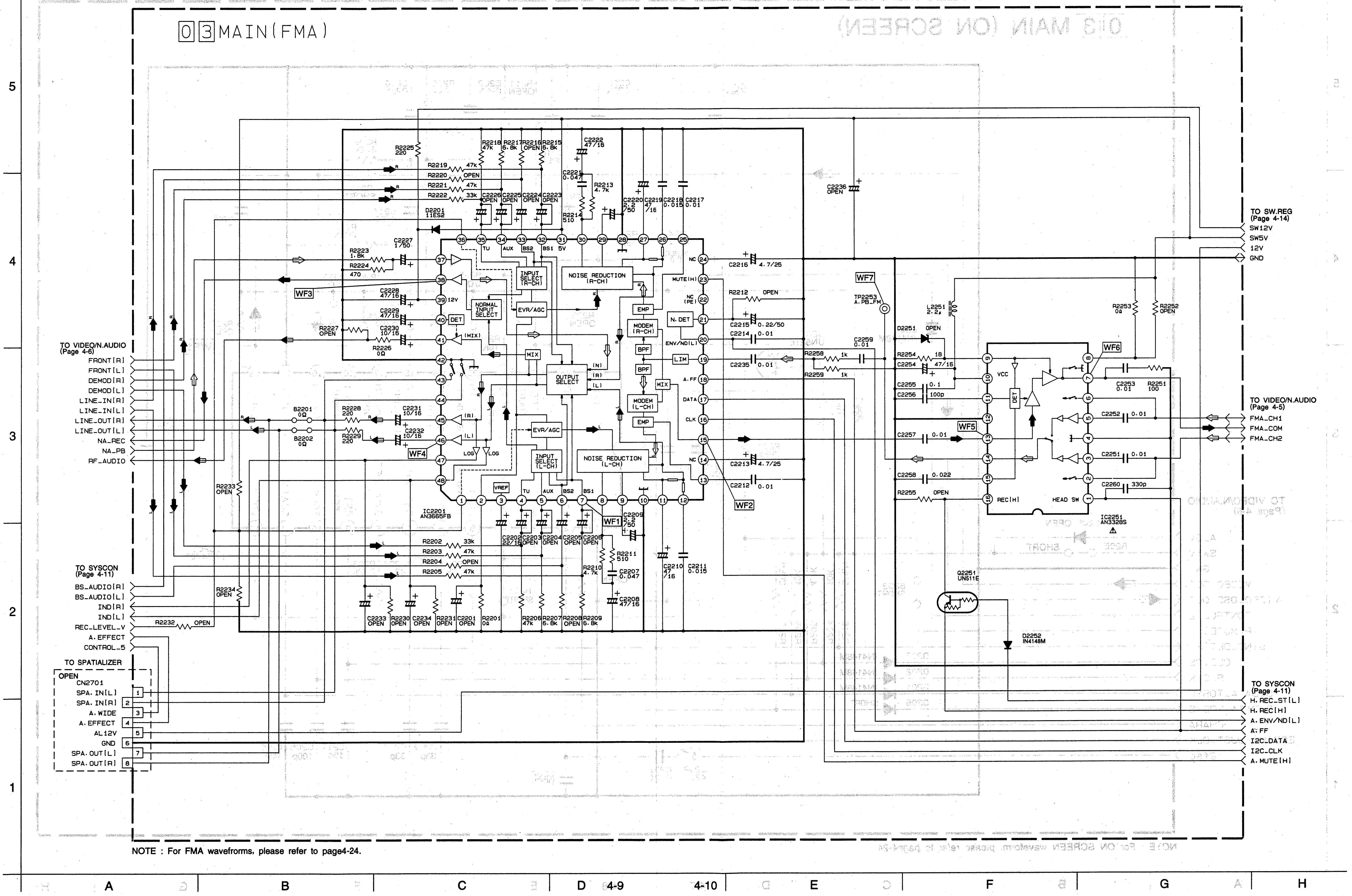
NOTE : For VIDEO, PRE/REC and AUDIO waveforms, please reter to page4-24.

4.3 ON SCREEN SCHEMATIC DIAGRAM


03 MAIN (ON SCREEN)
TO VIDEO/N.AUDIO
(Page 4-6)
AL6V
SW5V
GND
VIDEO_OUT
VIDEO_OSD_OUT
CONTROL_2
P.MUTE[L]
SYNC_DET[H]
OSD_CS
S_CLK
S_DATA_TOSYS
S_DATA_FRSYS
CHARA
EDS[H]/JUST_CLK
2fsc
D205 OPEN
B205
SHORT
B203
SHORT
D208
IN4148M
Q207
UN521E
L201
10μ
R201
OPEN
C215
100
/6.3
C214
0.01
C218
OPEN
C208
OPEN
R211
OPEN
B202
OPEN
R209
10k
C210
OPEN
C212
0.01
C216
OPEN
R208
2.2k
R213
SHORT
C213
1/50
C211
1/50
C209
0.01
R210
OPEN
L204
4.7μ
R214
330
B225
0Ω
B254
B223
0Ω
R212
1K
R228
OPEN
B255
OPEN
B224
0Ω
R230
10K
R207
OPEN
WF1
C207
0.01
VDD1
RST
CPDT
(CDLR)
CS2
(SEP_IN)
SEP_IN
(SEP_OUT)
SEP_OUT
(SEP_C)
CDLR
(SYN_IN)
SYN_IN
(VDD1)
VDD1
(CVCR)
CV_IN
VSS2
CVOUT
VSS1
XTAL_IN
MUTE
CHABLK
LN21
(HFTON_OUT)
OSC IN
OSC OUT
SYNC_DET
CS1
(CS)
SCLK
SDATA
VDD2
IC201
LC74785
OPEN
10K
4.7K
10K
OPEN
R216
R204
R205
R206
R215
R217
OPEN
B201
SHORT
R202
2.2k
L203
22μ
R203
2.2k
D207
IN4148M
D202
IN4148M
D201
IN4148M
D206
SHORT
L202
47μ
C201
0.01
C202
OPEN
C203
33p
C204
33p
C217
15p
C205
100p
C206
15p

NOTE : For ON SCREEN waveform, please refer to page4-24.

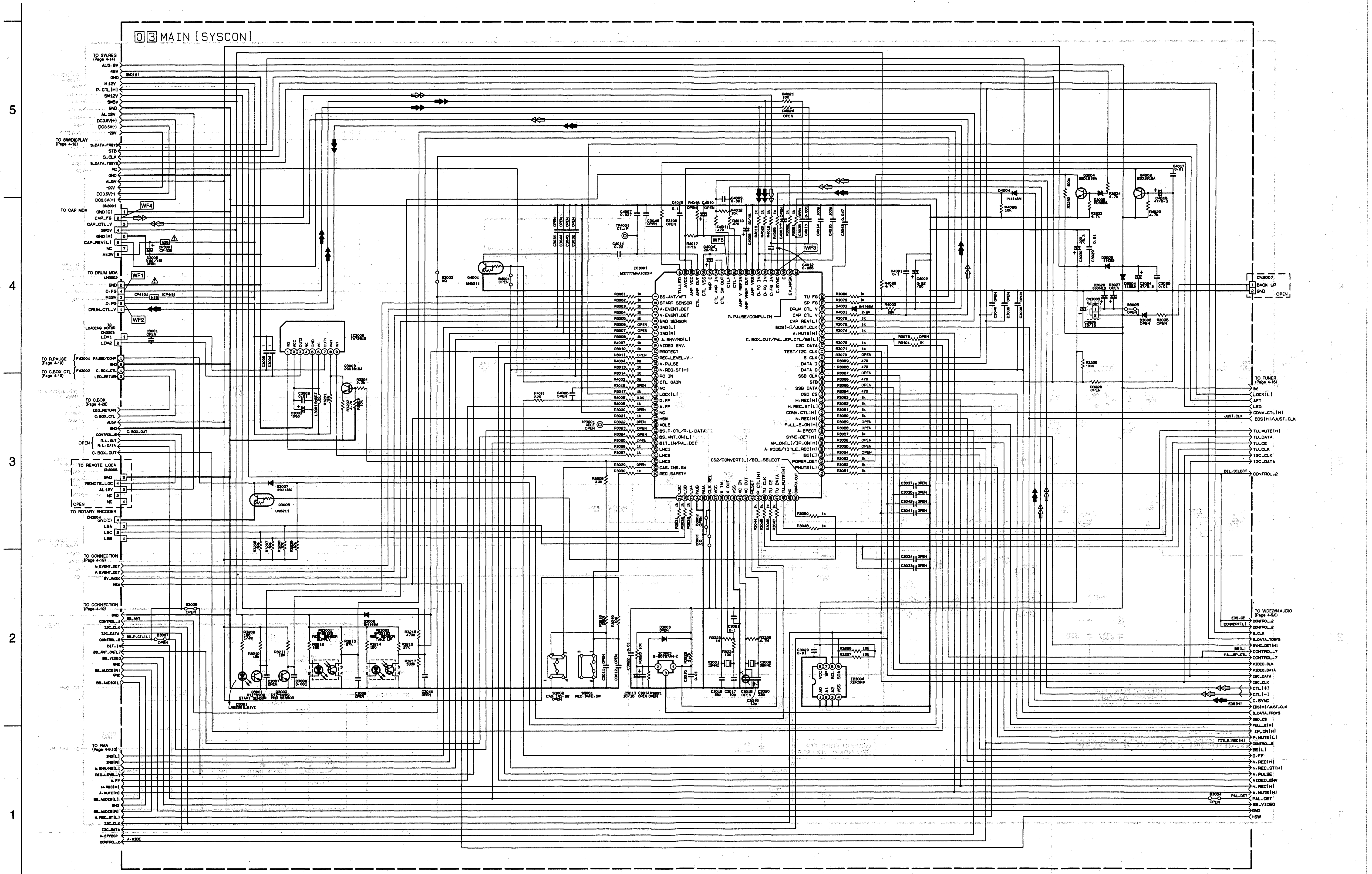
4.4 FMA SCHEMATIC DIAGRAM



03 MAIN(FMA)
TO VIDEO/N.AUDIO (Page 4-6)
FRONT[R]
FRONT[L]
DEMOD[R]
DEMOD[L]
LINE_IN[R]
LINE_IN[L]
LINE_OUT[R]
LINE_OUT[L]
NA_REC
NA_PB
RF_AUDIO
TO SYSCON (Page 4-11)
BS_AUDIO[R]
BS_AUDIO[L]
IND[R]
IND[L]
REC_LEVEL_V
A.EFFECT
CONTROL_5
TO SPATIALIZER
OPEN
CN2701
SPA.IN[L] 1
SPA.IN[R] 2
A.WIDE 3
A.EFFECT 4
AL12V 5
GND 6
SPA.OUT[L] 7
SPA.OUT[R] 8
R2232 OPEN
R2225 220
R2218 47k
R2217 6.8k
R2216 OPEN
R2215 6.8k
C2222 47/16
R2219 47k
R2220 OPEN
R2221 47k
R2222 33k
C2221 0.047
R2213 4.7k
C2226 OPEN
C2225 OPEN
C2224 OPEN
C2223 OPEN
R2214 510
C2220 2.2/50
C2219 47/16
C2218 0.015
C2217 0.01
D2201 11ES2
R2223 1.8k
C2227 1/50
R2224 470
WF3
C2228 47/16
C2229 47/16
C2230 10/16
R2227 OPEN
R2226 0Ω
TU
AUX
BS2
BS1
5V
12V
DET
(MIX)
INPUT SELECT (R-CH)
NORMAL INPUT SELECT
EVR/AGC
NOISE REDUCTION (R-CH)
EMP
MODEM (R-CH)
N.DET
BPF
LIM
BPF
MIX
MODEM (L-CH)
EMP
MIX
OUTPUT SELECT
(N)
(R)
(L)
LOG
LOG
EVR/AGC
INPUT SELECT (L-CH)
NOISE REDUCTION (L-CH)
VREF
NC
MUTE(H)
NC (PE)
ENV/ND(L)
A.FF
DATA
CLK
NC
B2201 0Ω
B2202 0Ω
R2228 220
R2229 220
C2231 10/16
C2232 10/16
WF4
R2233 OPEN
R2234 OPEN
IC2201 AN3665FB
C2202 22/16
C2203 OPEN
C2204 OPEN
C2205 OPEN
C2206 OPEN
WF1
C2209 2.2/50
R2211 510
R2210 4.7k
C2207 0.047
C2208 47/16
C2210 47/16
C2211 0.015
R2202 33k
R2203 47k
R2204 OPEN
R2205 47k
C2233 OPEN
R2230 OPEN
C2234 OPEN
R2231 OPEN
C2201 OPEN
R2201 0Ω
R2206 47k
R2207 6.8k
R2208 OPEN
R2209 6.8k
C2216 4.7/25
R2212 OPEN
C2215 0.22/50
C2214 0.01
C2235 0.01
C2213 4.7/25
C2212 0.01
WF2
C2236 OPEN
WF7
TP2253 A.PB_FM
C2259 0.01
R2258 1k
R2259 1k
D2251 OPEN
R2254 18
C2254 47/16
L2251 2.2μ
C2255 0.1
C2256 100p
C2257 0.01
C2258 0.022
R2255 OPEN
WF5
WF6
VCC
DET
REC(H)
HEAD SW
IC2251 AN3328S ⚠
R2253 0Ω
R2252 OPEN
C2253 0.01
R2251 100
C2252 0.01
C2251 0.01
C2260 330p
Q2251 UN511E
D2252 IN4148M
TO SW.REG (Page 4-14)
SW12V
SW5V
12V
GND
TO VIDEO/N.AUDIO (Page 4-5)
FMA_CH1
FMA_COM
FMA_CH2
TO SYSCON (Page 4-11)
H.REC_ST[L]
H.REC[H]
A.ENV/ND[L]
A.FF
I2C_DATA
I2C_CLK
A.MUTE[H]
5
4
3
2
1
A
B
C
D
E
F
G
H

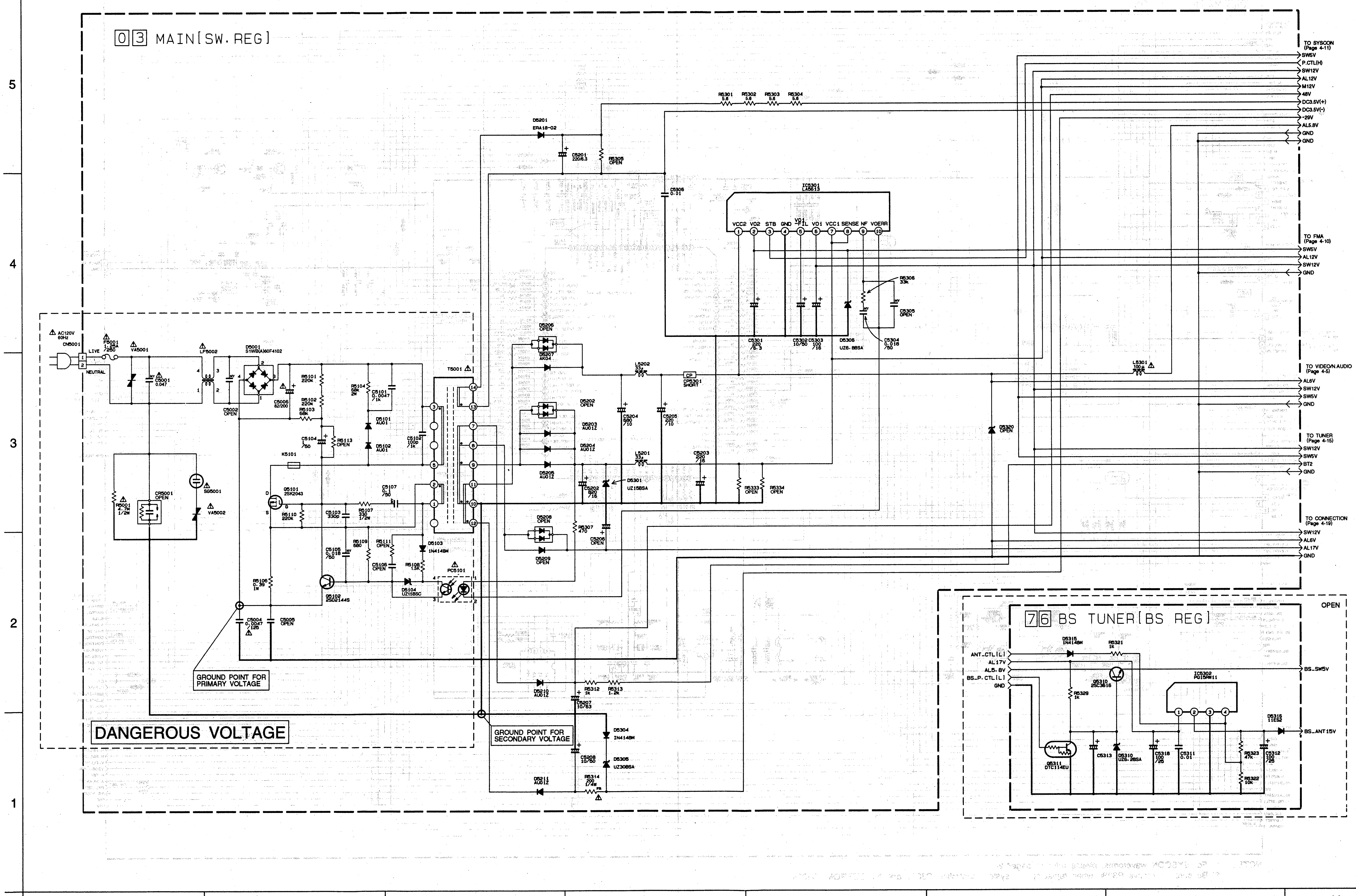
NOTE : For FMA wavefroms, please refer to page4-24.

4.5 SYSCON SCHEMATIC DIAGRAM

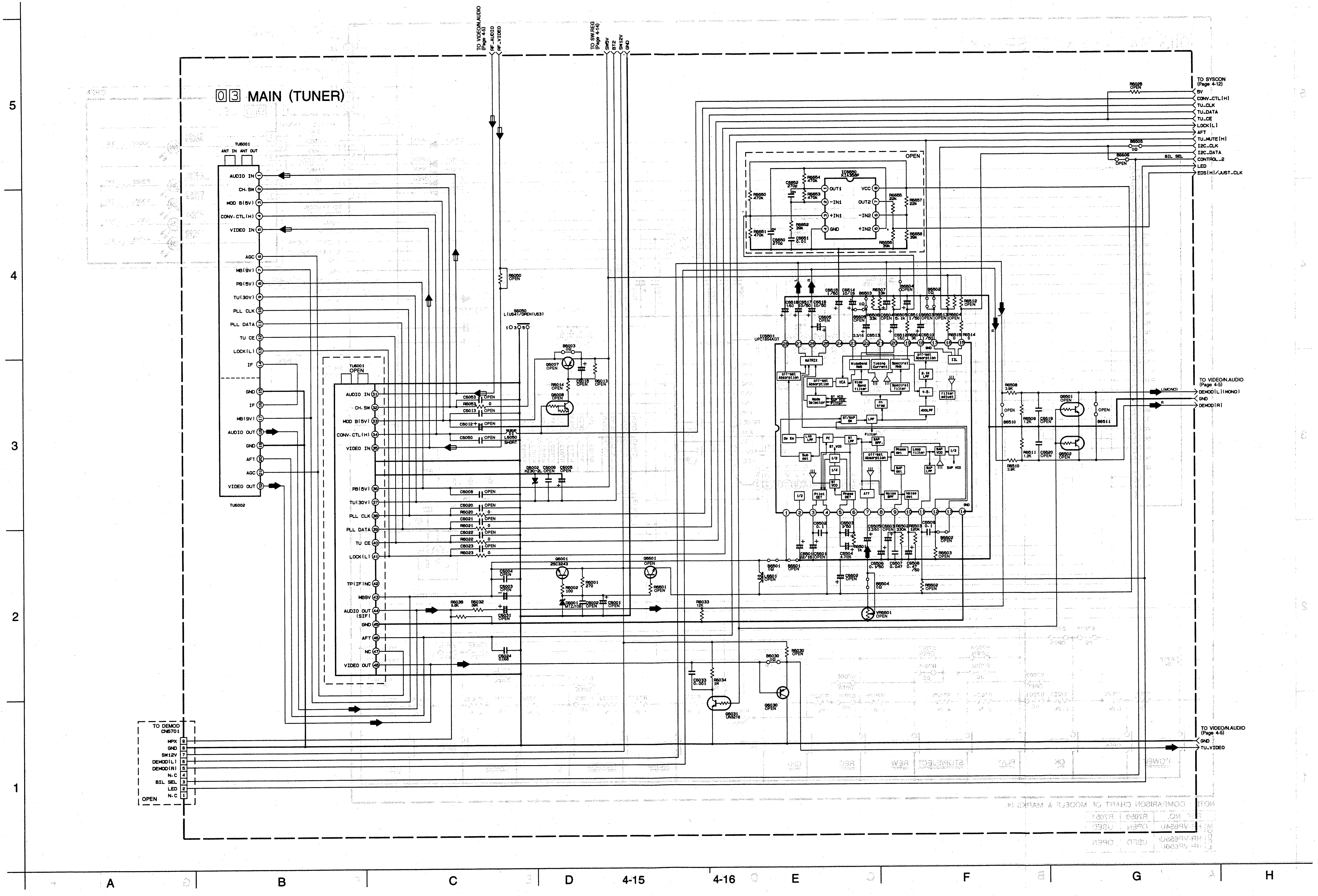

03 MAIN [SYSCON]
TO SW.REG (Page 4-14)
AL5.8V
48V
GND
M12V
P. CTL[H]
SW12V
SW5V
AL 12V
DC3.5V(+)
DC3.5V(-)
-29V
TO SW/DISPLAY (Page 4-18)
S.DATA_FRBYS
STB
S_CLK
S.DATA_TOBYS
RC
TO CAP MDA
CN3001
CAP_FG
CAP_CTL_V
CAP_REV[L]
NC
WF4
WF1
WF2
WF3
WF5
TO DRUM MDA
CN3002
D. FG
D. PG
DRUM_CTL_V
TO LOADING MOTOR
CN3003
LDM1
LDM2
TO R.PAUSE (Page 4-19)
TO C.BOX CTL (Page 4-19)
PAUSE/COMP
C. BOX_CTL
LED_RETURN
TO C.BOX (Page 4-28)
TO REMOTE LOCA
CN3006
REMOTE_LOC
TO ROTARY ENCODER
CN3004
LSA
LSC
LSB
TO CONNECTION (Page 4-19)
A. EVENT_DET
V. EVENT_DET
EV_MASK
HSW
TO CONNECTION (Page 4-19)
CONTROL_1
I2C_CLK
I2C_DATA
BIT_IN
BS_ANT_ON[L]
BS_VIDEO
BS_AUDIO[R]
BS_AUDIO[L]
TO FMA (Page 4-8,10)
IND[L]
IND[R]
A.ENV/NO[L]
REC_LEVEL_V
A. FF
H. REC[H]
A. MUTE[H]
H. REC_ST[L]
A. EFFECT
CONTROL_5
A. WIDE
IC3001
M37777MAA1C2GP
BS_ANT/AFT
START SENSOR
A. EVENT_DET
V. EVENT_DET
END SENSOR
VIDEO ENV.
PROTECT
REC_LEVEL_V
V. PULSE
N. REC_ST[H]
RC IN
CTL GAIN
LOCK[L]
D. FF
A. FF
BS_P. CTL/R. L. DATA
BS_ANT_ON[L]
BIT_IN/PAL_DET
CAS. INS. SW
REC SAFETY
TU FG
SP FG
DRUM CTL V
CAP CTL V
CAP REV[L]
EDS[H]/JUST_CLK
A. MUTE[H]
C. BOX_OUT/PAL_EP_CTL/BS[L]
I2C DATA
TEST/I2C CLK
S CLK
DATA 1
DATA 0
SSB CLK
STB
SSB DATA
OSD CS
H. REC[H]
H. REC_ST[L]
CONV. CTL[H]
N. REC[H]
FULL_E_ON[H]
A. EFECT
SYNC_DET[H]
AP_ON[L]/IP_ON[H]
A. WIDE/TITLE_REC[H]
EE[L]
POWER_DET
P. MUTE[L]
CS2/CONVERT[L]/BIL_SELECT
R. PAUSE/COMPU_IN
IC3002 TA7291S
Q3001 START SENSOR
Q3002 END SENSOR
PS3001 REEL SENSOR SUPPLY
PS3002 REEL SENSOR TAKE UP
D3001 LN8830L01VI
S3002 CAS. INS. SW
S3001 REC. SAFE. SW
IC3003 S-80727AN-Z
X3001 12MHz
X3002 32kHz
IC3004 X24C04P
CN3007
BACK UP
GND
OPEN
TO TUNER (Page 4-15)
LOCK[L]
AFT
LED
CONV_CTL[H]
EDS[H]/JUST_CLK
TU_MUTE[H]
TU_DATA
TU_CE
TU_CLK
I2C_CLK
I2C_DATA
BIL_SELECT
CONTROL_2
TO VIDEO/AUDIO (Page 4-5,6)
S.DATA_TOBYS
SYNC_DET[H]
CONTROL_7
VIDEO_CLK
VIDEO_DATA
CTL[+]
CTL[-]
C. SYNC
S.DATA_FRBYS
OSD_CS
FULL_E[H]
IP_ON[H]
P. MUTE[L]
TITLE_REC[H]
N. REC_ST[H]
V. PULSE
VIDEO_ENV
PAL_DET
BS_VIDEO
A
B
C
D
E
F
G
H
1
2
3
4
5

NOTES : 1. For SYSCON waveforms, please refer to page4-24.
2. Be sure to remove R3236 when replacing the system controller IC3001 and the EEPROM IC3004.

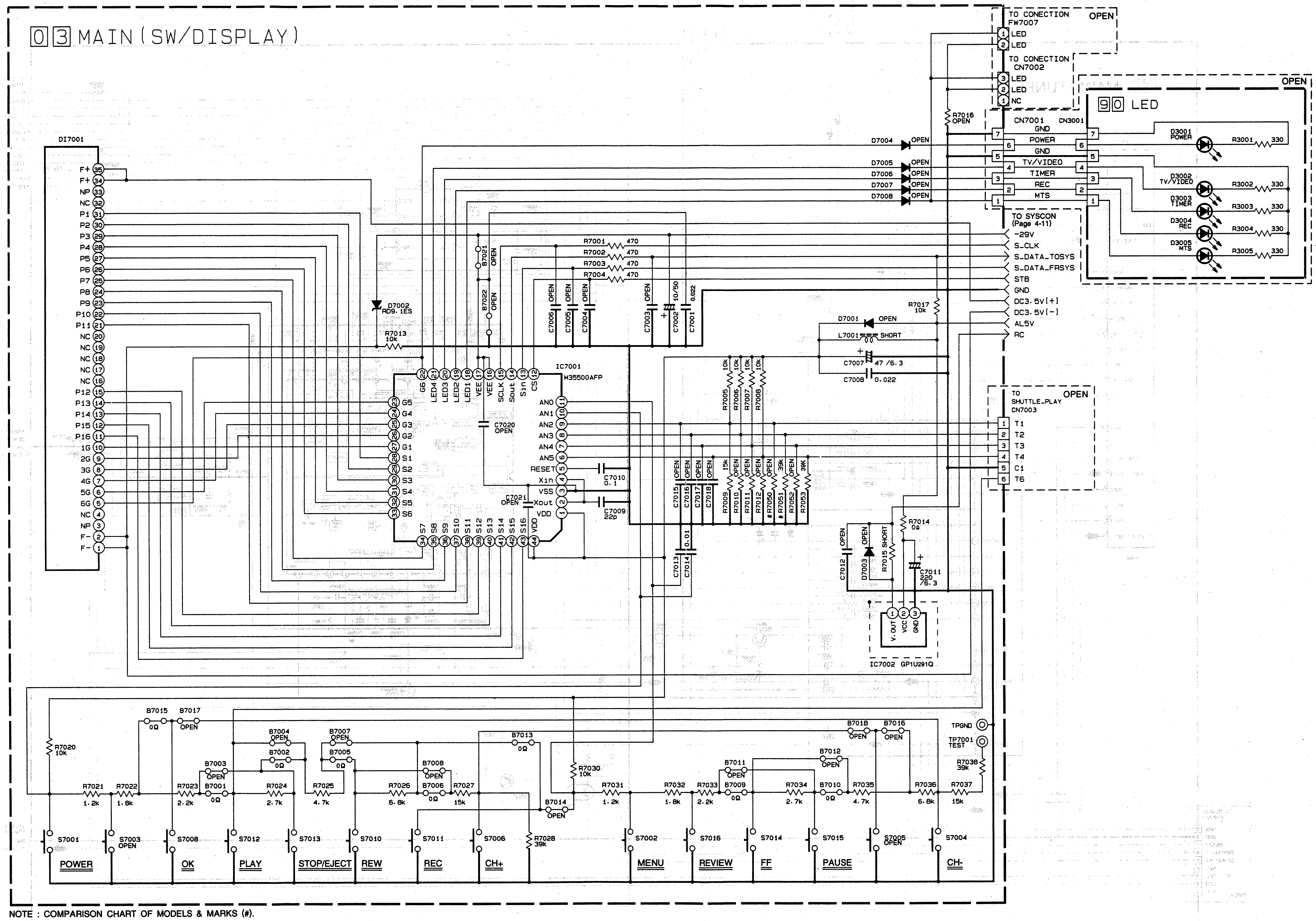
4.6 SWITCHING REGULATOR SCHEMATIC DIAGRAM


03 MAIN[SW.REG]
TO SYSCON (Page 4-11)
SW5V
P.CTL(H)
SW12V
AL12V
M12V
48V
DC3.5V(+)
DC3.5V(-)
-29V
AL5.8V
GND
GND
TO FMA (Page 4-10)
SW5V
AL12V
SW12V
GND
TO VIDEO/N.AUDIO (Page 4-5)
AL6V
SW12V
SW5V
GND
TO TUNER (Page 4-15)
SW12V
SW5V
BT2
GND
TO CONNECTION (Page 4-19)
SW12V
AL6V
AL17V
GND
R5301 5.6
R5302 5.6
R5303 5.6
R5304 5.6
D5201 ERA18-02
C5201 220/6.3
R5305 OPEN
C5306 0.01
IC5301 LA5613
VCC2 VO2 STB GND VO1-FIL VO1 VCC1 SENSE NF VOERR
1 2 3 4 5 6 7 8 9 10
R5306 33K
C5305 OPEN
C5301 220 /6.3
C5302 10/50
C5303 100 /16
D5306 UZ6.8BSA
C5304 0.018 /50
AC120V 60Hz
CN5001
LIVE
NEUTRAL
F5001 1.25A /250
VA5001
C5001 0.047
LF5002
D5001 S1WB(A)60F4102
C5002 OPEN
C5006 82/200
R5101 220K
R5102 220K
R5103 68K
R5104 68K 2W
C5101 0.0047 /1K
D5101 AU01
D5102 AU01
C5102 100p /1K
C5104 1 /50
R5113 OPEN
K5101
T5001
Q5101 2SK2043
D
G
S
R5110 220K
C5103 330p
R5107 330 1/2W
C5107 0.1 /50
R5001 4.7M 1/2W
CR5001 OPEN
SG5001
VA5002
C5105 0.018 /50
R5109 680
R5111 OPEN
C5106 OPEN
D5103 1N4148M
R5108 1.5K
PC5101
D5104 UZ15BSC
R5106 0.39 1W
Q5102 2SD2144S
C5004 0.0047 /125
C5005 OPEN
GROUND POINT FOR PRIMARY VOLTAGE
DANGEROUS VOLTAGE
GROUND POINT FOR SECONDARY VOLTAGE
D5206 OPEN
D5207 AK04
D5202 OPEN
D5203 AU01Z
D5204 AU01Z
D5205 AU01Z
L5202 33µ
CP CP5301 SHORT
C5204 680 /10
C5205 220 /10
L5201 33µ
C5203 220 /16
C5202 820 /16
D5301 UZ15BSA
R5333 OPEN
R5334 OPEN
D5208 OPEN
D5209 OPEN
R5307 470
C5206 OPEN
L5301 100µ
D5320 OPEN
D5210 AU01Z
R5312 1K
R5313 1.2K
C5207 10/63
D5304 1N4148M
D5305 UZ30BSA
C5208 10/50
D5211 AU01Z
R5314 200 1/4W
FR
OPEN
76 BS TUNER[BS REG]
ANT_CTL[L]
AL17V
AL5.8V
BS_P.CTL[L]
GND
D5315 1N4148M
R5321 1K
Q5310 2SC3616
R5329 1K
IC5302 PQ15RW11
1 2 3 4
D5316 11ES2
BS_SW5V
BS_ANT15V
Q5311 DTC114EU
C5313
D5310 UZ6.2BSA
C5318 100 /25
C5311 0.01
R5323 47K
C5312 100 /25
R5322 10K
5
4
3
2
1

4.7 TUNER SCHEMATIC DIAGRAM


03 MAIN (TUNER)
TO VIDEO/N.AUDIO
(Page 4-5)
RF_AUDIO
RF_VIDEO
TO SW.REG
(Page 4-14)
SW5V
BT2
SW12V
GND
TO SYSCON
(Page 4-12)
5V
CONV_CTL(H)
TU_CLK
TU_DATA
TU_CE
LOCK(L)
AFT
TU_MUTE(H)
I2C_CLK
I2C_DATA
BIL SEL
CONTROL_2
LED
EDS(H)/JUST_CLK
TU6001
ANT IN
ANT OUT
AUDIO IN
CH. SW
MOD B(5V)
CONV. CTL(H)
VIDEO IN
AGC
MB(9V)
PB(5V)
TU(30V)
PLL CLK
PLL DATA
TU CE
LOCK(L)
IF
GND
IF
MB(9V)
AUDIO OUT
GND
AFT
AGC
VIDEO OUT
TU6002
TU6001
OPEN
AUDIO IN
CH. SW
MOD B(5V)
CONV. CTL(H)
VIDEO IN
PB(5V)
TU(30V)
PLL CLK
PLL DATA
TU CE
LOCK(L)
TP(IF)NC
MB9V
AUDIO OUT
(SIF)
GND
AFT
NC
VIDEO OUT
IC6850
OPEN
OUT1
-IN1
+IN1
GND
VCC
OUT2
-IN2
+IN2
IC6801
UPC1854AGT
MATRIX
VCA
Wideband RMS
Timing Current
Spectral RMS
Mode Selector
ST VCO
SAP VCO
Filter
De Em
Sub det
Pilot DET
Phase DET
ATT
Noise BPF
Noise det
Loop filter
SAP det
SAP LPF
Filter adjust
Q6001
2SC3243
Q6007
OPEN
Q6008
OPEN
Q6801
OPEN
Q6802
OPEN
Q6030
OPEN
Q6031
UN5216
VR6801
OPEN
L6050
SHORT
S6050
L(US4)/OPEN(US3)
TO VIDEO/N.AUDIO
(Page 4-5)
L(MONO)
R
DEMOD(L)(MONO)
GND
DEMOD(R)
TO VIDEO/N.AUDIO
(Page 4-5)
GND
TU_VIDEO
TO DEMOD
CN6701
MPX
GND
SW12V
DEMOD(L)
DEMOD(R)
N.C
BIL SEL
LED
N.C
OPEN
5
4
3
2
1
A
B
C
D
E
F
G
H

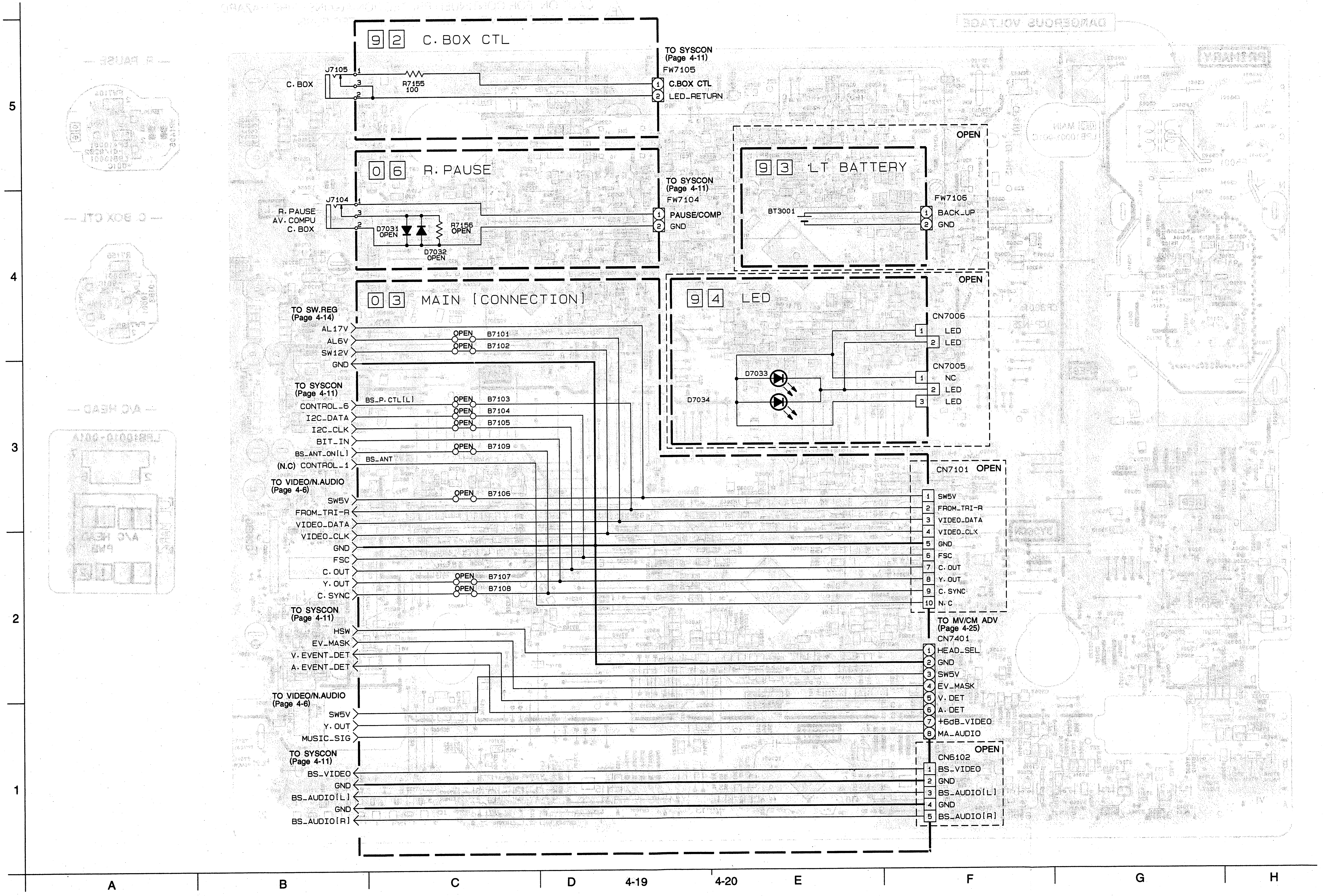
4.8 SW/DISPLAY SCHEMATIC DIAGRAM


03 MAIN (SW/DISPLAY)
90 LED
DI7001
IC7001 M35500AFP
IC7002 GP1U291Q
TO CONECTION FW7007
TO CONECTION CN7002
CN7001
CN3001
TO SYSCON (Page 4-11)
TO SHUTTLE_PLAY CN7003
OPEN
LED
NC
GND
POWER
TV/VIDEO
TIMER
REC
MTS
-29V
S_CLK
S_DATA_TOSYS
S_DATA_FRSYS
STB
DC3.5V(+)
DC3.5V(-)
AL5V
RC
T1
T2
T3
T4
C1
T6
D3001 POWER
D3002 TV/VIDEO
D3003 TIMER
D3004 REC
D3005 MTS
R3001 330
R3002 330
R3003 330
R3004 330
R3005 330
D7004
D7005
D7006
D7007
D7008
R7016 OPEN
R7017 10k
D7001 OPEN
L7001 SHORT
C7007 47 /6.3
C7008 0.022
D7002 RD9.1ES
R7013 10k
R7001 470
R7002 470
R7003 470
R7004 470
B7021 OPEN
B7022 OPEN
C7006 OPEN
C7005 OPEN
C7004 OPEN
C7003 OPEN
C7002 10/50
C7001 0.022
C7020 OPEN
C7021 OPEN
C7010 0.1
C7009 22p
R7005 10k
R7006 10k
R7007 10k
R7008 10k
C7015 OPEN
C7016 OPEN
C7017 OPEN
C7018 OPEN
R7009 15k
R7010 OPEN
R7011 OPEN
R7012 OPEN
#R7050 OPEN
#R7051 39k
R7052 OPEN
R7053 39K
C7013 0.01
C7014
C7012 OPEN
D7003 OPEN
R7015 SHORT
R7014 0Ω
C7011 220 /6.3
V.OUT
VCC
GND
F+
NP
NC
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
P12
P13
P14
P15
P16
1G
2G
3G
4G
5G
6G
F-
G6
LED4
LED3
LED2
LED1
VEE
SCLK
Sout
Sin
CS
G5
G4
G3
G2
G1
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
S16
VDD
AN0
AN1
AN2
AN3
AN4
AN5
RESET
Xin
VSS
Xout
B7015 0Ω
B7017 OPEN
B7004 OPEN
B7002 0Ω
B7007 OPEN
B7005 0Ω
B7003 OPEN
B7001 0Ω
B7008 OPEN
B7006 0Ω
B7013 0Ω
B7014 OPEN
B7011 OPEN
B7009 0Ω
B7012 OPEN
B7010 0Ω
B7018 OPEN
B7016 OPEN
R7020 10k
R7021 1.2k
R7022 1.8k
R7023 2.2k
R7024 2.7k
R7025 4.7k
R7026 6.8k
R7027 15k
R7028 39k
R7030 10k
R7031 1.2k
R7032 1.8k
R7033 2.2k
R7034 2.7k
R7035 4.7k
R7036 6.8k
R7037 15k
R7038 39k
TPGND
TP7001 TEST
S7001
S7003 OPEN
S7008
S7012
S7013
S7010
S7011
S7006
S7002
S7016
S7014
S7015
S7005 OPEN
S7004
POWER
OK
PLAY
STOP/EJECT
REW
REC
CH+
MENU
REVIEW
FF
PAUSE
CH-
5
4
3
2
1

NOTE : COMPARISON CHART OF MODELS & MARKS (#).

	REF. NO.	R7050	R7051
MODEL	HR-VP654U	OPEN	USED
	HR-VP655U/ HR-VP656U	USED	OPEN

4.9 CONNECTION SCHEMATIC DIAGRAM

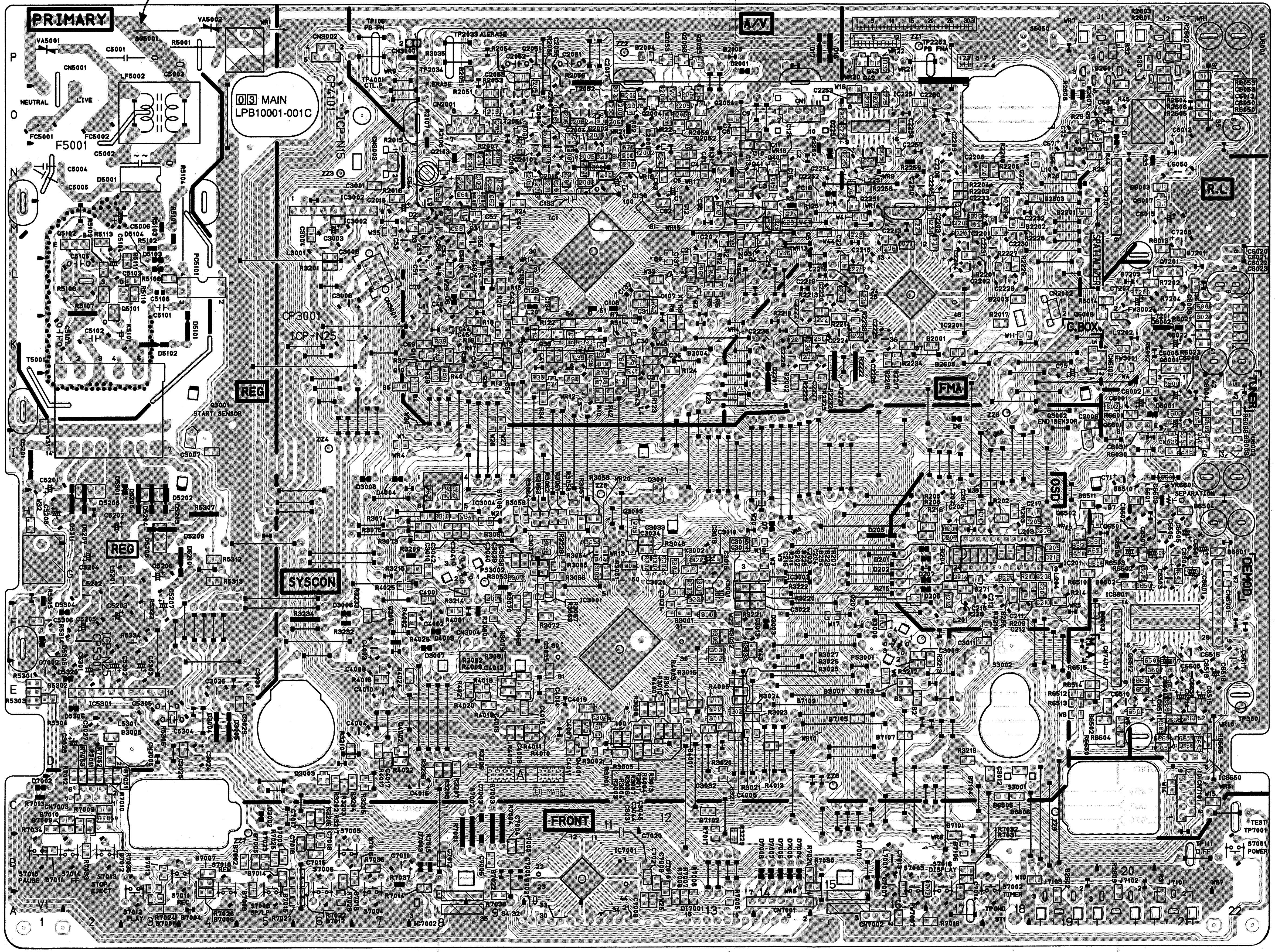


92 C. BOX CTL
C. BOX
J7105
R7155
100
TO SYSCON
(Page 4-11)
FW7105
1 C.BOX CTL
2 LED_RETURN
06 R. PAUSE
R. PAUSE
AV. COMPU
C. BOX
J7104
D7031
OPEN
D7032
OPEN
R7156
OPEN
TO SYSCON
(Page 4-11)
FW7104
1 PAUSE/COMP
2 GND
OPEN
93 LT BATTERY
BT3001
FW7106
1 BACK_UP
2 GND
OPEN
94 LED
CN7006
1 LED
2 LED
CN7005
1 NC
2 LED
3 LED
D7033
D7034
03 MAIN [CONNECTION]
TO SW.REG
(Page 4-14)
AL17V
AL6V
SW12V
GND
OPEN B7101
OPEN B7102
TO SYSCON
(Page 4-11)
CONTROL_6
I2C_DATA
I2C_CLK
BIT_IN
BS_ANT_ON[L]
(N.C) CONTROL_1
BS_P.CTL[L]
BS_ANT
OPEN B7103
OPEN B7104
OPEN B7105
OPEN B7109
TO VIDEO/N.AUDIO
(Page 4-6)
SW5V
FROM_TRI-R
VIDEO_DATA
VIDEO_CLK
GND
FSC
C. OUT
Y. OUT
C. SYNC
OPEN B7106
OPEN B7107
OPEN B7108
CN7101 OPEN
1 SW5V
2 FROM_TRI-R
3 VIDEO_DATA
4 VIDEO_CLK
5 GND
6 FSC
7 C. OUT
8 Y. OUT
9 C. SYNC
10 N. C
TO SYSCON
(Page 4-11)
HSW
EV_MASK
V. EVENT_DET
A. EVENT_DET
TO MV/CM ADV
(Page 4-25)
CN7401
1 HEAD_SEL
2 GND
3 SW5V
4 EV_MASK
5 V. DET
6 A. DET
7 +6dB_VIDEO
8 MA_AUDIO
TO VIDEO/N.AUDIO
(Page 4-6)
SW5V
Y. OUT
MUSIC_SIG
TO SYSCON
(Page 4-11)
BS_VIDEO
GND
BS_AUDIO[L]
GND
BS_AUDIO[R]
OPEN
CN6102
1 BS_VIDEO
2 GND
3 BS_AUDIO[L]
4 GND
5 BS_AUDIO[R]
5
4
3
2
1
A
B
C
D
E
F
G
H

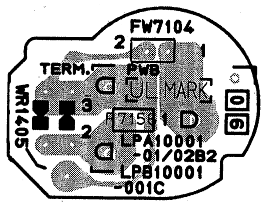
4.10 MAIN AND A/C HEAD CIRCUIT BOARDS

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND RATED FUSE(S).

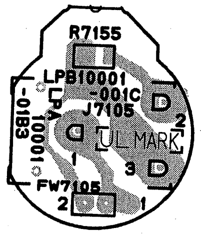
DANGEROUS VOLTAGE


PRIMARY
03 MAIN
LPB10001-001C
A/V
REG
SYSCON
FMA
OSD
C.BOX
R.L
TUNER
DEMOD
FRONT
CP4101 ICP-N15
CP3001 ICP-N25
CP5301 ICP-N25
F5001
NEUTRAL
LIVE
START SENSOR
END SENSOR
S7015 PAUSE
S7014 FF
S7013 STOP/EJECT
S7012 PLAY
S7011 REC
S7008 SP/LP
S7004
S7002 TIMER
S7003 DISPLAY
S7001 POWER
TEST TP7001

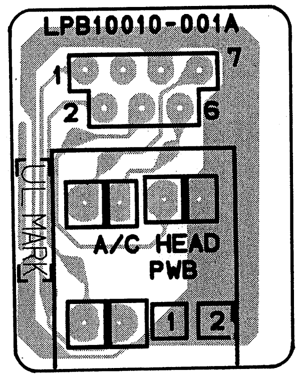
— R. PAUSE —


FW7104
TERM.
PWB
UL MARK
WR1405
J7156
LPA10001-01/02B2
LPB10001-001C
06

— C. BOX CTL —


R7155
LPB10001-001C
J7105
LPA10001-01B3
UL MARK
FW7105

— A/C HEAD —


LPB10010-001A
UL MARK
A/C HEAD PWB

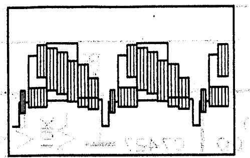
COMPONENT PARTS LOCATION GUIDE <MAIN>

REF.NO.	LOCATION		
CAPACITOR			
C1	A	D	11N
C2	B	C	13O
C3	B	C	12N
C4	B	C	12N
C5	B	C	12N
C6	A	D	12N
C7	A	D	12N
C8	B	C	13O
C9	B	C	13O
C10	B	C	13N
C11	B	C	14N
C12	B	C	12M
C13	A	D	13N
C14	B	C	13N
C15	B	C	14N
C16	A	D	13N
C17	B	C	13M
C18	B	C	14N
C19	B	C	14N
C20	A	D	13M
C21	B	C	12L
C22	B	C	13M
C23	B	C	14M
C24	B	C	14M
C25	B	C	14M
C26	B	C	14M
C27	B	C	12L
C29	A	D	14M
C30	A	D	11K
C31	B	C	12L
C32	B	C	11K
C34	B	C	11K
C35	B	C	10K
C36	B	C	12K
C37	A	D	12K
C38	B	C	11K
C39	B	C	10K
C40	B	C	10K
C41	B	C	10K
C42	B	C	9K
C43	B	C	9L
C44	B	C	9K
C45	B	C	9K
C46	B	C	9L
C47	B	C	9L
C48	A	D	8L
C49	B	C	9K
C50	B	C	9K
C51	A	D	8L
C52	A	D	7M
C53	A	D	8M
C54	A	D	8M
C55	A	D	9M
C56	A	D	8M
C57	B	C	9M
C58	B	C	8M
C59	B	C	8M
C60	B	C	9M
C61	B	C	8N
C62	B	C	9M
C63	B	C	9N
C64	A	D	8N
C65	B	C	8N
C66	B	C	19N
C67	A	D	19N
C68	A	D	20O
C69	B	C	8K
C70	A	D	8L
C71	A	D	20I
C72	B	C	19O
C73	B	C	10K
C74	B	C	11J
C75	A	D	19J
C81	B	C	13N
C82	B	C	12M
C83	B	C	12N
C84	B	C	12N
C94	B	C	10J
C95	B	C	13M
C107	B	C	12L
C108	A	D	11L
C121	B	C	8M
C123	B	C	10L
C124	B	C	9M
C125	B	C	9N
C126	B	C	14N
C132	A	D	11L
C133	A	D	11N
C134	B	C	10L
C135	B	C	10L
C136	B	C	12M
C137	B	C	12L
C201	B	C	17H
C202	B	C	17H
C203	B	C	18G
C204	B	C	18G
C205	B	C	18H
C206	B	C	19H
C207	B	C	17H
C208	B	C	19G
C209	B	C	19G
C210	B	C	19F
C211	A	D	18F
C212	B	C	18G
C213	A	D	18G
C214	B	C	17G
C215	A	D	17G
C216	B	C	17G
C217	B	C	18H
C218	B	C	19G
C2001	B	C	11N
C2002	A	D	11O
C2003	B	C	11N
C2004	A	D	10N
C2005	B	C	10N
C2006	B	C	11N
C2007	A	D	10N
C2008	B	C	11N
C2009	A	D	10N
C2010	A	D	10N
C2011	B	C	10N
C2012	B	C	10N
C2013	B	C	10N
C2015	A	D	10N
C2016	A	D	8M
C2017	A	D	12O
C2051	B	C	9O
C2052	A	D	10P
C2053	B	C	9O
C2054	B	C	10O
C2055	A	D	10O
C2061	A	D	10P
C2062	B	C	10O
C2063	B	C	10O
C2064	A	D	10O
C2201	A	D	17M
C2202	A	D	17L
C2203	A	D	17M
C2204	A	D	17M
C2205	A	D	17M
C2206	A	D	17N
C2207	B	C	17M
C2208	A	D	17N
C2209	A	D	17N
C2210	A	D	16N
C2211	B	C	16M
C2212	B	C	16M
C2213	A	D	16M
C2214	B	C	15L
C2215	A	D	15L
C2216	A	D	15L
C2217	B	C	15L
C2218	B	C	15L
C2219	A	D	15L
C2220	A	D	15L
C2221	B	C	15K
C2222	A	D	14K
C2224	A	D	15K
C2225	A	D	16K
C2226	A	D	16K
C2227	A	D	15K
C2228	A	D	14K
C2229	A	D	18L
C2230	A	D	18M
C2231	A	D	18M
C2232	A	D	18M
C2233	A	D	17M
C2234	A	D	18M
C2235	B	C	15M
C2236	A	D	14K
C2251	B	C	16O
C2252	B	C	15O
C2253	B	C	15O
C2254	A	D	15N
C2255	B	C	15N
C2256	B	C	16N
C2257	B	C	16N
C2258	B	C	16O
C2259	B	C	16N
C2260	B	C	16O
C3001	B	C	7N
C3002	B	C	6M
C3003	A	D	6M
C3004	B	C	6M
C3005	B	C	6M
C3006	A	D	7L
C3007	B	C	4I
C3008	B	C	19J
C3009	B	C	16F
C3010	B	C	8G
C3011	B	C	18F
C3012	B	C	18D
C3013	A	D	13F
C3014	B	C	13G
C3015	B	C	13G
C3016	B	C	13G
C3017	B	C	13G
C3018	A	D	13G
C3019	B	C	13G
C3020	B	C	12G
C3021	B	C	12F
C3022	B	C	14F
C3023	B	C	8H
C3024	A	D	4D
C3025	B	C	4D
C3026	A	D	4E
C3027	A	D	2D
C3028	A	D	2D
C3029	B	C	5E
C3030	A	D	5E
C3031	B	C	12D
C3032	B	C	13D
C3033	B	C	12G
C3034	B	C	12H
C3035	B	C	10E
C3036	B	C	10G
C3037	B	C	10G
C3038	B	C	9G
C3039	B	C	10G
C3040	B	C	8H
C3041	B	C	8H
C3042	B	C	8H
C3043	B	C	11G
C3044	B	C	12D
C3045	B	C	12D
C3046	B	C	11D
C4001	B	C	8G
C4002	A	D	8F
C4003	A	D	7F
C4004	A	D	7D
C4005	B	C	13D
C4007	B	C	10D
C4008	A	D	7E
C4009	B	C	9D
C4010	A	D	7E
C4011	B	C	10D
C4012	B	C	9E
C4013	B	C	9E
C4014	B	C	10E
C4015	B	C	10E
C4016	A	D	8C
C4017	B	C	7D
C4019	B	C	11E
C5001	A	D	2P
C5002	A	D	2N
C5003	A	D	4P
C5004	A	D	1N
C5005	A	D	1N
C5006	A	D	2M
C5101	A	D	3L
C5102	A	D	2K
C5103	B	C	3L
C5104	A	D	2M
C5105	A	D	2L
C5106	A	D	3L
C5107	A	D	1K
C5201	A	D	1H
C5202	A	D	3H
C5203	A	D	3F
C5204	A	D	2G
C5205	A	D	2F
C5206	A	D	3G
C5207	A	D	3G
C5208	A	D	1H
C5301	A	D	2E
C5302	A	D	2E
C5303	A	D	3E
C5304	A	D	3D
C5305	A	D	3E
C5306	B	C	1F
C6001	A	D	20J
C6002	B	C	20J
C6003	A	D	21J
C6004	B	C	21J
C6005	A	D	21K
C6006	B	C	21L
C6008	B	C	21L
C6012	A	D	21O
C6013	B	C	21O
C6015	A	D	21M
C6020	B	C	22L
C6021	B	C	22K
C6022	B	C	22K
C6023	B	C	22K
C6024	B	C	21J
C6031	A	D	21J
C6033	B	C	21I
C6050	B	C	21O
C6053	B	C	21O
C6501	A	D	21G
C6502	B	C	21G
C6503	A	D	21G
C6504	A	D	21G
C6505	A	D	21H
C6506	A	D	21H
C6507	B	C	20G
C6508	A	D	20G
C6509	B	C	20G
C6510	A	D	20E
C6511	A	D	20E
C6512	A	D	20F
C6513	A	D	21F
C6514	A	D	21E
C6515	A	D	21E
C6516	A	D	21F
C6517	A	D	22F
C6518	A	D	22E
C6519	B	C	19H
C6520	B	C	19G
C6601	A	D	21G
C6602	A	D	20H
C6603	A	D	20G
C6604	A	D	21E
C6605	A	D	21E
C6650	B	C	21D
C6651	B	C	21E
C6652	B	C	21D
C7001	A	D	9B
C7002	A	D	1E
C7003	A	D	9C
C7004	B	C	9B
C7005	B	C	9B
C7006	B	C	9B
C7007	A	D	16B
C7008	B	C	12A
C7009	B	C	12B
C7010	B	C	12B
C7011	A	D	7B
C7012	B	C	8B
C7013	B	C	16B
C7014	B	C	17A
C7015	B	C	6B
C7016	B	C	6B
C7017	B	C	6B
C7018	B	C	6B
C7020	A	D	12B
C7021	B	C	12B
C7206	A	D	21M
C7207	A	D	20L
CONNECTOR			
CN1	A	D	14O
CN2001	A	D	9O
CN2002	A	D	19L
CN2701	A	D	20N
CN3001	A	D	7L
CN3002	A	D	6P
CN3003	A	D	7N
CN3004	A	D	9F
CN3005	A	D	2D
CN3007	A	D	8P
CN5001	A	D	1O
CN6102	A	D	19K
CN6701	A	D	22G
CN7001	A	D	13A
CN7002	A	D	15A
CN7003	A	D	2C
CN7101	A	D	21C
CN7401	A	D	20F
CIRCUIT PROTECTOR			
CP3001	A	D	7K
CP4101	A	D	6O
CP5301	A	D	2F
DIODE			
D1	A	D	20O
D2	B	C	8M
D3	B	C	8M
D6	A	D	8L
D7	A	D	14H
D8	A	D	17J
D16	A	D	15P
D17	A	D	15P
D201	A	D	17G
D202	A	D	17G
D205	A	D	15H
D206	A	D	17G
D207	A	D	17G
D2001	A	D	14P
D2201	A	D	14J
D2251	A	D	15N
D2252	A	D	15N
D3001	A	D	12H
D3002	A	D	5C
D3003	A	D	14F
D3004	A	D	4D
D3005	A	D	4D
D3006	A	D	7F
D3007	A	D	8F
D3008	A	D	7I
D4003	A	D	8F
D4004	A	D	7I
D5001	B	C	3N
D5101	A	D	4K
D5102	A	D	3K
D5103	A	D	3L
D5104	A	D	3L
D5201	A	D	1I
D5202	A	D	3H
D5203	A	D	3I
D5204	A	D	3I
D5205	A	D	3I
D5206	A	D	2H
D5207	A	D	2I
D5208	A	D	3G
D5209	A	D	4H
D5210	A	D	4H
D5211	A	D	2H
D5301	A	D	3I
D5304	A	D	2F
D5305	A	D	1F
D5306	A	D	2E
D5320	A	D	1E
D6001	A	D	21J
D6002	A	D	20K
D7001	A	D	16B
D7002	A	D	1C
D7003	A	D	8B
D7004	A	D	14B
D7005	A	D	14B
D7006	A	D	14B
D7007	A	D	14B
D7008	A	D	14B
D7031	A	D	18O
D7032	A	D	17O
IC			
IC1	B	C	11M
IC201	A	D	17H
IC2201	B	C	16L
IC2251	B	C	16O
IC3001	B	C	11F
IC3002	A	D	6M
IC3003	A	D	14G
IC3004	A	D	8I
IC5301	A	D	2E
IC6501	B	C	21F
IC6650	A	D	21D
IC7001	B	C	11B
IC7002	A	D	8A
JACK			
J1	A	D	20Q
J2	A	D	21Q
J7101	A	D	21A
J7102	A	D	20A
J7103	A	D	19A
J7104	A	D	19O
COIL			
L1	A	D	12O
L2	A	D	14N
L3	A	D	14N
L4	A	D	12J
L5	A	D	11J
L6	A	D	10K
L7	A	D	8K
L8	A	D	8M
L9	A	D	8M
L10	A	D	19N
L11	A	D	8L
L17	A	D	12K
L20	A	D	10L
L201	A	D	17F
L202	A	D	17H
L203	A	D	18H
L204	A	D	19G
L2001	A	D	12O
L2251	A	D	15N
L3001	A	D	6M
L5201	A	D	3G
L5202	A	D	2G
L5301	A	D	2E
L6050	A	D	21N
L6601	A	D	20H
L7001	A	D	16B
L7201	A	D	21L
L7202	A	D	20K
TRANSISTOR			
Q1	B	C	13L
Q2	B	C	12L
Q3	B	C	13M
Q4	B	C	14M
Q5	B	C	14M
Q6	B	C	11K
Q7	B	C	9K
Q8	B	C	19O
Q9	B	C	20O
Q10	B	C	8K
Q11	B	C	8K
Q12	B	C	11J
Q20	B	C	10J
Q30	B	C	9J
Q31	B	C	9M
Q38	B	C	10K
Q39	B	C	12K
Q40	B	C	14N
Q41	B	C	14N
Q42	B	C	15P
Q43	B	C	16P
Q207	B	C	16G
Q2001	B	C	9O
Q2002	B	C	10O
Q2003	B	C	11O
Q2004	B	C	12O
Q2051	B	C	10P
Q2052	B	C	12O
Q2053	B	C	12P
Q2054	B	C	13O
Q2055	B	C	12P
Q2061	B	C	11O
Q2062	B	C	12O
Q2063	B	C	12P
Q2103	B	C	8N
Q2251	B	C	15M
Q3001	A	D	4I
Q3002	A	D	19I
Q3003	B	C	6C
Q3004	B	C	7F
Q3005	B	C	11G
Q4001	B	C	11D
Q4002	B	C	7D
Q5101	A	D	2L
Q5102	A	D	2M
Q6001	A	D	21K
Q6007	B	C	21M
Q6008	B	C	20L
Q6030	B	C	21I
Q6031	B	C	21I
Q6501	B	C	20H
Q6502	B	C	19H
Q6601	A	D	20J
Q7201	A	D	21L
RESISTOR			
R1	B	C	13N
R2	B	C	13M
R3	B	C	14M
R4	B	C	13L
R5	B	C	13L
R6	B	C	13L
R7	B	C	11K
R8	B	C	12K
R9	B	C	12K
R10	B	C	11J
R11	B	C	11J
R12	B	C	13L
R13	B	C	9J
R14	B	C	10K
R15	B	C	9K
R16	B	C	9K
R17	B	C	9K
R18	B	C	9K
R19	B	C	9K
R20	B	C	9L
R21	B	C	9N
R22	B	C	8N
R23	B	C	9N
R24	B	C	9M
R25	B	C	9N
R26	B	C	19N
R27	B	C	19N
R28	B	C	19N
R29	A	D	19O
R30	B	C	20P
R31	B	C	21A
R32	B	C	20P
R33	A	D	20N
R34	B	C	10J
R35	B	C	10J
R36	B	C	8K
R37	B	C	8K
R38	B	C	8K
R39	B	C	8K
R40	B	C	8K
R41	B	C	11K
R42	B	C	11J
R43	B	C	11J
R44	B	C	20N
R45	B	C	20O
R51	B	C	11K
R52	A	D	11O
R66	B	C	13L
R67	B	C	9L
R110	B	C	8M
R122	B	C	10K
R123	B	C	12J
R124	B	C	12K
R125	A	D	14M
R131	A	D	13N
R132	B	C	16P
R135	B	C	13M
R201	B	C	17H
R202	B	C	18H
R203	B	C	18H
R204	B	C	17G
R205	B	C	17H
R206	B	C	17H
R207	B	C	19G
R208	B	C	19G
R209	B	C	18G
R210	B	C	18G
R211	B	C	17G
R212	B	C	17G
R213	A	D	17F
R214	B	C	19F
R215	B	C	17G
R216	B	C	17H
R217	B	C	17H
R228	B	C	17G
R2001	B	C	11N
R2002	B	C	12N
R2003	B	C	11N
R2004	B	C	11N
R2005	B	C	11N
R2006	B	C	10N
R2007	B	C	9O
R2008	B	C	9N
R2009	B	C	9N
R2010	B	C	10N
R2011	B	C	9N
R2012	B	C	9N
R2013	B	C	9N
R2014	B	C	10N
R2015	B	C	8N
R2016	B	C	7N
R2017	B	C	18K
R2018	B	C	10O
R2019	B	C	11O
R2020	B	C	11O
R2021	B	C	11O
R2051	B	C	9O
R2052	B	C	9O
R2053	B	C	9O
R2054	B	C	9P
R2055	B	C	10P
R2056	A	D	11P
R2057	B	C	12O
R2058	B	C	12O
R2059	B	C	12O
R2060	B	C	13O
R2061	B	C	10O
R2062	B	C	11O
R2063	B	C	11O
R2106	A	D	8N
R2107	A	D	8N
R2201	B	C	17M
R2202	B	C	17M
R2203	B	C	17N
R2204	B	C	17N
R2205	B	C	18N
R2206	B	C	17M
R2207	B	C	17M
R2208	B	C	18N
R2209	B	C	18N
R2210	B	C	17M
R2211	B	C	17M
R2212	B	C	15L
R2213	B	C	15L
R2214	B	C	15K
R2215	B	C	14K
R2216	B	C	14K
R2217	B	C	16K
R2218	B	C	16K
R2219	B	C	14K
R2220	A	D	15J
R2221	B	C	15K
R2222	A	D	15J
R2223	B	C	14J
R2224	B	C	14K
R2225	B	C	15J
R2226	B	C	18L
R2227	B	C	18L
R2228	B	C	18M
R2229	B	C	18M
R2230	B	C	17M
R2231	B	C	17M
R2232	B	C	15K
R2233	B	C	15K
R2234	B	C	16K
R2251	B	C	16O
R2252	A	D	15N
R2253	B	C	15O
R2254	B	C	15O
R2255	B	C	15N
R2258	B	C	15N
R2259	A	D	16N
R2261	B	C	16M
R2601	B	C	21P
R2602	B	C	21P
R2603	B	C	21P
R2604	B	C	21P
R2605	B	C	21O
R2606	B	C	21P
R2607	A	D	19O
R2608	A	D	19O
R2609	B	C	20A
R3001	B	C	11D
R3002	B	C	11D
R3003	B	C	11D
R3004	B	C	11D
R3005	B	C	11D
R3006	B	C	11D
R3007	B	C	12D
R3008	B	C	12E
R3010	B	C	12E
R3011	B	C	12D
R3013	B	C	12D
R3014	B	C	12E
R3016	B	C	12E
R3017	B	C	13D
R3020	B	C	13D
R3021	B	C	13D
R3022	B	C	13E
R3023	B	C	13D
R3024	B	C	14E
R3025	B	C	13E
R3026	B	C	13E
R3027	B	C	13E
R3029	B	C	13F
R3030	B	C	13F
R3031	B	C	13F
R3032	B	C	13F
R3033	B	C	13F
R3035	A	D	8P
R3044	B	C	12G
R3045	B	C	12G
R3046	B	C	12G
R3047	B	C	12G
R3048	B	C	12G
R3050	B	C	11G
R3051	B	C	11G
R3052	B	C	11G
R3053	A	D	9G
R3054	B	C	11G
R3055	B	C	11H
R3056	B	C	11H
R3057	B	C	11H
R3058	B	C	10H
R3059	B	C	9H
R3060	B	C	9H
R3061	B	C	10H
R3062	B	C	10H
R3063	B	C	10H
R3064	B	C	10H
R3065	B	C	10G
R3066	B	C	10G
R3067	B	C	10G
R3068	B	C	10G
R3069	B	C	10G
R3070	B	C	9F
R3071	B	C	9G
R3072	B	C	10F
R3073	B	C	8H
R3074	B	C	8H
R3075	B	C	8H
R3076	B	C	9G
R3079	B	C	9F
R3080	A	D	9F
R3081	B	C	9E
R3082	B	C	9E
R3100	B	C	11D
R3101	B	C	8H
R3201	B	C	6L
R3202	B	C	6C
R3203	B	C	6C
R3204	B	C	7C
R3205	B	C	7C
R3206	B	C	9D
R3207	B	C	8D
R3208	B	C	8D
R3209	A	D	8G
R3210	B	C	6D
R3211	B	C	13D
R3212	B	C	16E
R3213	B	C	17E
R3214	B	C	8G
R3215	B	C	8G
R3216	B	C	6C
R3217	B	C	6C
R3218	B	C	18F
R3219	B	C	17D
R3220	B	C	14G
R3221	B	C	13F
R3222	B	C	14G
R3223	B	C	12G
R3224	B	C	12G
R3225	B	C	13G
R3226	B	C	8H
R3227	B	C	8H
R3228	B	C	10G
R3229	B	C	13B
R3232	A	D	7F
R3233	B	C	7F
R3234	A	D	6F
R3236	B	C	8D
R4001	B	C	8F
R4002	B	C	8F
R4003	B	C	12E
R4004	B	C	12D
R4005	B	C	13E
R4006	B	C	13E
R4007	B	C	12E
R4009	B	C	9E
R4010	B	C	10D
R4011	B	C	10D
R4012	B	C	9D
R4013	B	C	14D
R4016	B	C	7E
R4017	B	C	7D
R4018	B	C	9E
R4019	B	C	9E
R4020	B	C	9E
R4021	B	C	9E
R4022	B	C	7D
R4024	B	C	8E
R4025	B	C	7G
R4026	A	D	7F
R5001	A	D	4P
R5101	A	D	3M
R5102	A	D	3M
R5103	A	D	3M
R5104	A	D	4L
R5106	A	D	2L
R5107	A	D	2L
R5108	B	C	3L
R5109	B	C	2L
R5110	B	C	3L
R5111	B	C	3L
R5113	B	C	2M
R5301	B	C	1E
R5302	B	C	1E
R5303	B	C	1E
R5304	B	C	1E
R5305	A	D	1F
R5306	B	C	3D
R5307	A	D	4H
R5312	B	C	4G
R5313	B	C	4G
R5314	A	D	1F
R5333	A	D	3F
R5334	A	D	3F
R6001	B	C	21J
R6002	B	C	20J
R6013	B	C	21M
R6014	B	C	20L
R6020	B	C	21K
R6021	B	C	21K
R6022	B	C	21K
R6023	B	C	21K
R6025	B	C	20J
R6030	B	C	21I
R6032	B	C	21J
R6033	B	C	21J
R6034	B	C	21I
R6038	B	C	22J
R6050	B	C	21O
R6053	B	C	21P
R6501	B	C	21G
R6502	B	C	21G
R6503	B	C	20G
R6504	B	C	20E
R6505	B	C	20E
R6506	B	C	20E
R6507	B	C	20E
R6508	B	C	19G
R6509	B	C	19G
R6510	B	C	19G
R6511	B	C	19G
R6512	B	C	19E
R6513	B	C	19E
R6514	B	C	19E
R6515	B	C	19E
R6601	B	C	20J
R6602	A	D	20G
R6603	B	C	20G
R6604	B	C	20D
R6650	B	C	20D
R6651	B	C	21E
R6652	B	C	21D
R6653	B	C	21D
R6654	B	C	21D
R6655	B	C	21D
R6656	B	C	21D
R6657	B	C	21D
R6658	B	C	21D
R7001	A	D	8B
R7002	A	D	9B
R7003	A	D	9B
R7004	A	D	9B
R7005	B	C	13A
R7006	B	C	12A
R7007	B	C	12A
R7008	B	C	12A
R7009	B	C	2C
R7010	B	C	2D
R7011	B	C	2D
R7012	B	C	2D
R7013	A	D	1C
R7014	B	C	8B
R7015	A	D	8B
R7016	B	C	17A
R7017	B	C	13B
R7020	B	C	14B
R7021	B	C	17B
R7022	B	C	6B
R7023	B	C	5B
R7024	B	C	3B
R7025	B	C	5B
R7026	B	C	4B
R7027	B	C	6A
R7028	B	C	6A
R7030	B	C	15B
R7031	B	C	17B
R7032	B	C	17B
R7033	B	C	2B
R7034	B	C	1C
R7035	B	C	2C
R7036	B	C	7B
R7037	A	D	8B
R7038	B	C	9A
R7050	B	C	2C
R7051	B	C	2D
R7052	B	C	2D
R7053	B	C	2D
R7202	B	C	20L
R7203	B	C	20L
R7204	A	D	21L
SWITCH			
S3001	A	D	18C
S3002	A	D	18F
S6050	A	D	18P
S7001	A	D	22B
S7002	A	D	18B
S7003	A	D	16B
S7004	A	D	7B
S7005	A	D	6B
S7006	A	D	6B
S7008	A	D	5B
S7010	A	D	4B
S7011	A	D	4B
S7012	A	D	3B
S7013	A	D	2B
S7014	A	D	2B
S7015	A	D	1B
S7016	A	D	17B
TEST POINT			
TP106	A	D	7P
TP111	A	D	21B
TP2033	A	D	9P
TP2034	A	D	9P
TP2253	A	D	17P
TP3001	A	D	22E
TP4001	A	D	7P
TP7001	A	D	22C
TPGND	A	D	17A
OTHERS			
DI7001	A	D	12A
F5001	A	D	1O
FW3001	A	D	20K
FW3002	A	D	20K
FW7007	A	D	16A
K5101	A	D	3K
LF5002	A	D	4O
PC5101	A	D	4L
PS3001	A	D	16F
PS3002	A	D	8G
SG5001	A	D	4P
T2051	A	D	9O
T2052	A	D	11O
T5001	A	D	1K
TU6001	A	D	22P
VA5001	A	D	1P
VA5002	A	D	4Q
VR6601	A	D	21H
X1	A	D	12L
X2	A	D	12L
X3001	A	D	13F
X3002	A	D	12G

WAVEFORMS

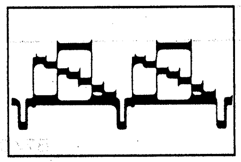
— VIDEO/N.AUDIO —

WF1 IC1-28



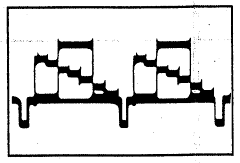
REC 1.1 Vp-p
50 mV/20 µsec/DIV

WF2 IC1-23



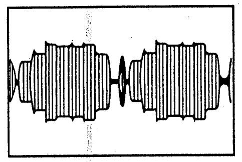
PB 0.62 Vp-p
20 mV/20 µsec/DIV

WF3 IC1-19



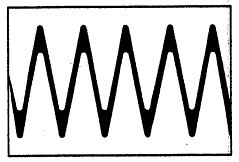
REC/PB 0.56 Vp-p
20 mV/20 µsec/DIV

WF4 IC1-58



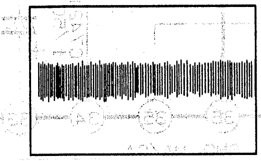
PB 0.56 Vp-p
20 mV/5 msec/DIV

WF5 IC1-4



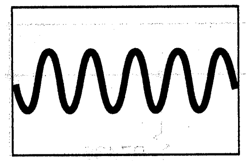
REC 1.14 Vp-p
20 mV/0.5 msec/DIV

WF6 IC1-2



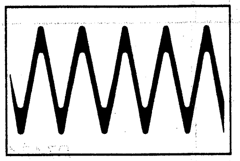
PB 8 mVp-p
5 mV/5 msec/DIV

WF7 IC1-9



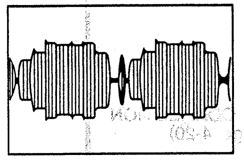
REC 0.17 Vp-p
5 mV/1 msec/DIV

WF8 IC1-11



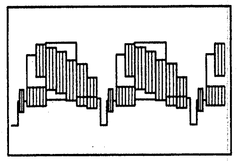
PB 0.88 Vp-p
20 mV/0.5 msec/DIV

WF9 IC1-55



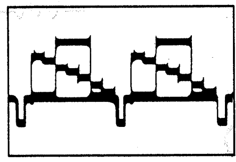
PB 0.58 Vp-p
20 mV/20 µsec/DIV

WF10-1 IC1-52



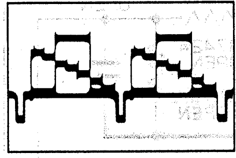
REC 2.3 Vp-p
0.1 V/20 µsec/DIV

WF10-2 IC1-52



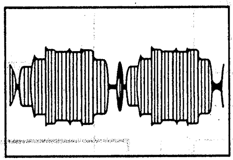
PB 2.2 Vp-p
0.1 V/20 µsec/DIV

WF11 IC1-42



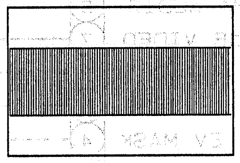
PB 0.48 Vp-p
20 mV/20 µsec/DIV

WF12 IC1-46



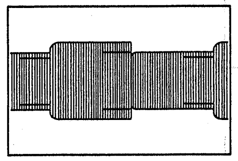
PB 0.36 Vp-p
10 mV/20 µsec/DIV

WF13 IC1-87



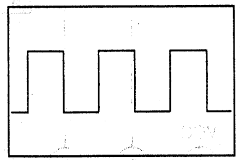
REC 1.7 Vp-p
0.1 V/1 msec/DIV

WF14 TP106 PB FM



PB 0.32 Vp-p
10 mV/2 msec/DIV

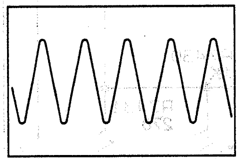
WF15 TP111 D.FF



REC/PB 5.4 Vp-p
0.2 V/10 msec/DIV

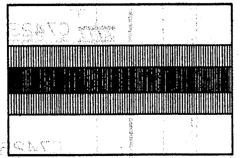
— FMA —

WF1 IC2201-7



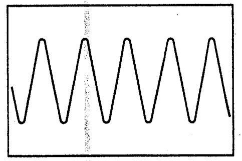
REC 0.14 Vp-p
5 mV/0.5 msec/DIV

WF2 IC2201-15



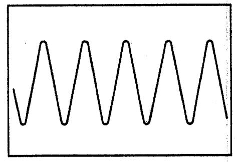
REC 0.28 Vp-p
10 mV/1 msec/DIV

WF3 IC2201-38



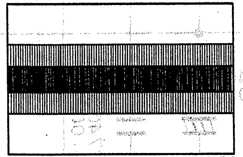
REC 0.3 Vp-p
10 mV/0.5 msec/DIV

WF4 IC2201-46



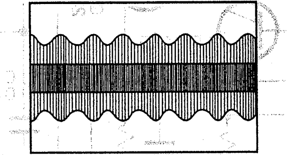
REC/PB 1.5 Vp-p
50 mV/0.5 msec/DIV

WF5 IC2251-13



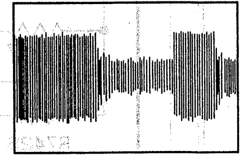
REC 0.28 Vp-p
10 mV/1 msec/DIV

WF6 IC2251-7



REC 1.6 Vp-p
50 mV/2 msec/DIV

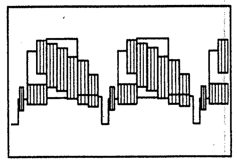
WF7 TP2253 A.PB FM



PB 0.1 Vp-p
20 mV/5 msec/DIV

— ON SCREEN —

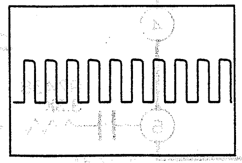
WF1 IC201-13



REC 2.2 Vp-p
50 mV/20 µsec/DIV

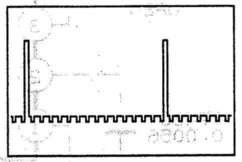
— SYSCON —

WF1 CN3002-4 D.FG



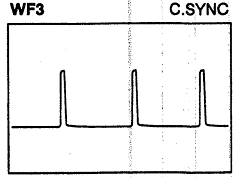
REC/PB 3.6 Vp-p
0.2 V/1 msec/DIV

WF2 CN3002-2 D.PG



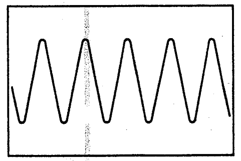
REC/PB 3.5 Vp-p
0.1 V/5 msec/DIV

WF3 IC3001-84 C.SYNC



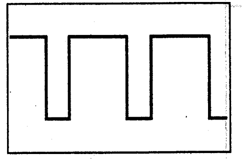
REC 3.4 Vp-p
0.2 V/20 µsec/DIV

WF4 CN3001-2 CAP FG



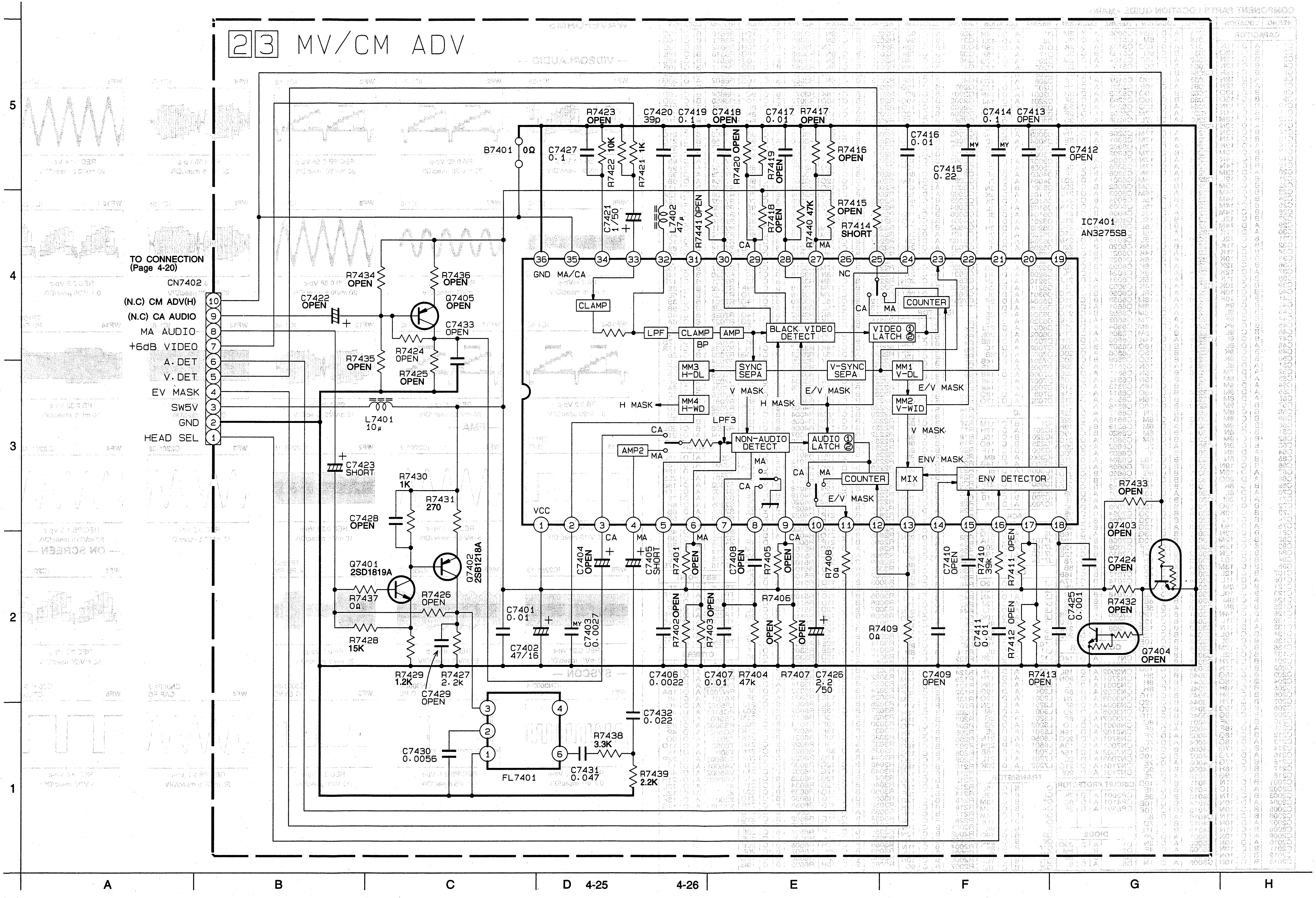
REC/PB 2.2 Vp-p
50 mV/0.5 msec/DIV

WF5 IC3001-92 CTL(+)

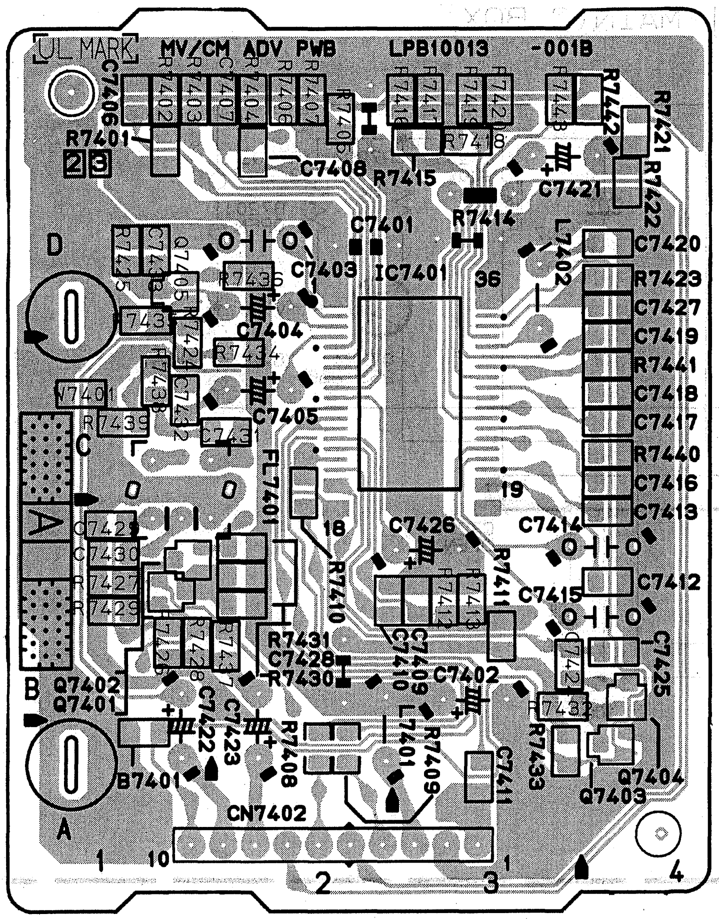


REC 4.0 Vp-p
0.1 V/10 msec/DIV

4.11 MOVIE/COMMERCIAL ADVANCE SCHEMATIC DIAGRAM


23 MV/CM ADV
TO CONNECTION (Page 4-20)
CN7402
(N.C) CM ADV(H) 10
(N.C) CA AUDIO 9
MA AUDIO 8
+6dB VIDEO 7
A.DET 6
V.DET 5
EV MASK 4
SW5V 3
GND 2
HEAD SEL 1
R7423 OPEN
C7420 39p
C7419 0.1
C7418 OPEN
C7417 0.01
R7417 OPEN
C7414 0.1
C7413 OPEN
B7401 0Ω
C7427 0.1
R7422 10K
R7421 1K
R7420 OPEN
R7419 OPEN
R7416 OPEN
C7416 0.01
C7415 0.22
MY
C7412 OPEN
C7421 1/50
L7402 47μ
R7441 OPEN
R7418 OPEN
R7440 47K
R7415 OPEN
R7414 SHORT
IC7401 AN3275SB
CA
MA
36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19
GND MA/CA
NC
R7434 OPEN
R7436 OPEN
C7422 OPEN
Q7405 OPEN
C7433 OPEN
R7424 OPEN
R7435 OPEN
R7425 OPEN
CLAMP
LPF
CLAMP
BP
AMP
BLACK VIDEO DETECT
VIDEO ① LATCH ②
COUNTER
CA
MA
MM3 H-DL
SYNC SEPA
V-SYNC SEPA
MM1 V-DL
V MASK
E/V MASK
E/V MASK
H MASK
MM4 H-WD
H MASK
MM2 V-WID
LPF3
L7401 10μ
CA
AMP2
MA
NON-AUDIO DETECT
AUDIO ① LATCH ②
V MASK
ENV MASK
MA
CA
CA
MA
COUNTER
E/V MASK
MIX
ENV DETECTOR
R7433 OPEN
C7423 SHORT
R7430 1K
R7431 270
C7428 OPEN
VCC
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
CA
MA
MA
CA
Q7403 OPEN
C7424 OPEN
Q7401 2SD1819A
Q7402 2SB1218A
R7437 0Ω
R7426 OPEN
R7428 15K
C7404 OPEN
C7405 SHORT
R7401 OPEN
R7408 OPEN
R7405 OPEN
R7408 0Ω
C7410 OPEN
R7410 39k
R7411 OPEN
R7432 OPEN
C7401 0.01
C7402 47/16
C7403 0.0027
R7402 OPEN
R7403 OPEN
R7406
OPEN
OPEN
R7409 0Ω
C7411 0.01
R7412 OPEN
C7425 0.001
Q7404 OPEN
R7429 1.2K
R7427 2.2k
C7429 OPEN
C7406 0.0022
C7407 0.01
R7404 47k
R7407
C7426 2.2 /50
C7409 OPEN
R7413 OPEN
3 4
2
1 6
C7430 0.0056
FL7401
C7432 0.022
R7438 3.3K
C7431 0.047
R7439 2.2K
1 2 3 4 5
A B C D E F G H

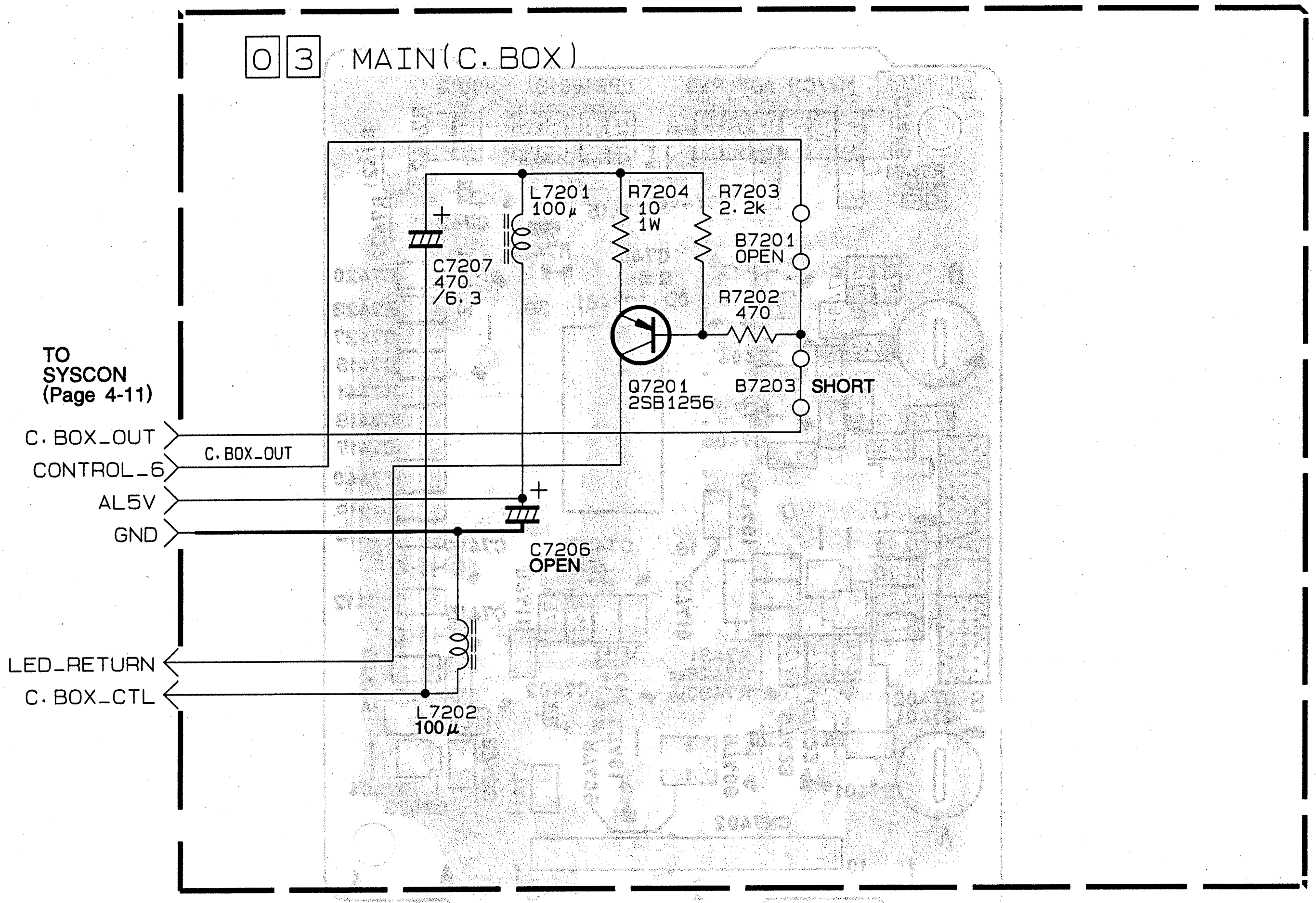
4.12 MOVIE/COMMERCIAL ADVANCE CIRCUIT BOARD


UL MARK
MV/CM ADV PWB
LPB10013 -001B
C7406
R7402
R7403
C7407
R7404
R7406
R7407
R7405
R7416
R7417
R7419
R7420
R7443
R7442
R7421
R7422
R7401
2 3
C7408
R7415
R7418
C7421
R7414
C7401
L7402
C7420
R7423
C7427
C7419
R7441
C7418
C7417
R7440
C7416
C7413
D
R7425
C7433
Q7405
R7436
C7403
IC7401
36
R7437
R7424
R7434
C7404
V7401
R7438
C7432
R7439
C7431
C7405
FL7401
19
18
C
A
C7429
C7430
R7427
R7429
C7426
R7410
R7411
C7414
C7415
C7412
R7426
R7428
R7435
R7431
C7428
R7430
C7409
C7410
R7412
R7413
C7402
C7424
C7425
B
Q7402
Q7401
C7422
C7423
R7408
L7401
R7409
R7432
R7433
C7411
Q7404
Q7403
B7401
CN7402
A
1
10
2
3
1
4

COMPONENT PARTS LOCATION GUIDE <MV/CM ADVANCE>

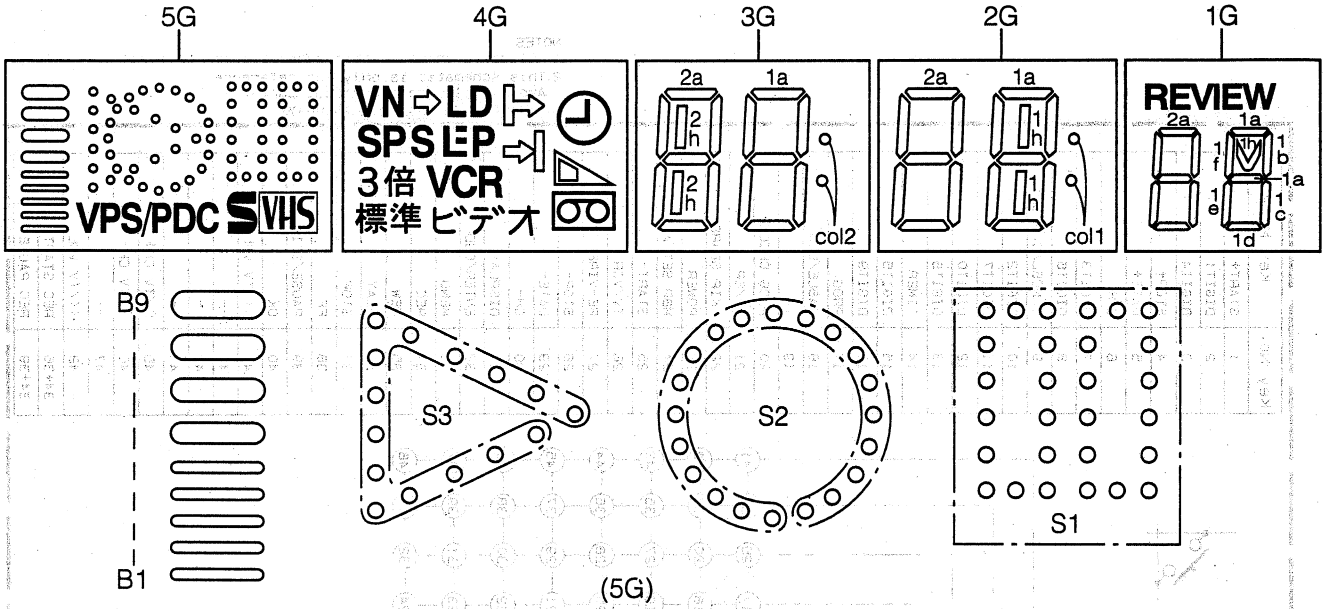
REF.NO.	LOCATION		
CAPACITOR			
C7401	A	D	2D
C7402	A	D	3B
C7403	A	D	2D
C7404	A	D	2D
C7405	A	D	2C
C7406	B	C	1E
C7407	B	C	2E
C7408	B	C	2D
C7409	B	C	3B
C7410	B	C	2B
C7411	B	C	3A
C7412	B	C	4B
C7413	B	C	4B
C7414	A	D	4B
C7415	A	D	4B
C7416	B	C	4C
C7417	B	C	4C
C7418	B	C	4C
C7419	B	C	4C
C7420	B	C	4D
C7421	A	D	3D
C7422	A	D	1B
C7423	A	D	2A
C7424	B	C	3B
C7425	B	C	4B
C7426	A	D	3B
C7427	B	C	4D
C7428	B	C	2B
C7429	B	C	1B
C7430	B	C	1B
C7431	B	C	2C
C7432	B	C	1C
C7433	B	C	1D
CONNECTOR			
CN7402	A	D	3A
IC			
IC7401	B	C	3C
COIL			
L7401	A	D	2B
L7402	A	D	3C
TRANSISTOR			
Q7401	B	C	1B
Q7402	B	C	1B
Q7403	B	C	4A
Q7404	B	C	4B
Q7405	B	C	1D
RESISTOR			
R7401	B	C	1D
R7402	B	C	1E
R7403	B	C	1E
R7404	B	C	2E
R7405	B	C	2E
R7406	B	C	2E
R7407	B	C	2E
R7408	B	C	2A
R7409	B	C	2A
R7410	B	C	2C
R7411	B	C	3B
R7412	B	C	3B
R7413	B	C	3B
R7414	A	D	3D
R7415	B	C	3D
R7416	B	C	3E
R7417	B	C	3E
R7418	B	C	3D
R7419	B	C	3E
R7420	B	C	3E
R7421	B	C	4D
R7422	B	C	4D
R7423	B	C	4D
R7424	B	C	1C
R7425	B	C	1D
R7426	B	C	1B
R7427	B	C	1B
R7428	B	C	1B
R7429	B	C	1B
R7430	B	C	2B
R7431	B	C	2B
R7432	B	C	3A
R7433	B	C	3A
R7434	B	C	2C
R7435	B	C	1C
R7436	B	C	2D
R7437	B	C	2B
R7438	B	C	1C
R7439	B	C	1C
R7440	B	C	4C
R7441	B	C	4C
R7442	B	C	4E
R7443	B	C	3E
OTHER			
FL7401	A	D	2B

4.13 CABLE.BOX SCHEMATIC DIAGRAM


03 MAIN(C.BOX)
TO SYSCON (Page 4-11)
C.BOX_OUT
CONTROL_6
AL5V
GND
LED_RETURN
C.BOX_CTL
C.BOX_OUT
L7201 100μ
R7204 10 1W
R7203 2.2k
B7201 OPEN
C7207 470 /6.3
R7202 470
Q7201 2SB1256
B7203 SHORT
C7206 OPEN
L7202 100μ

4.14 FDP GRID ASSIGNMENT AND ANODE CONNECTION

GRID ASSIGNMENT


5G
4G
3G
2G
1G
VPS/PDC
S VHS
VN ⇨ LD
SP S L:P
3倍 VCR
標準 ビデオ
2a
1a
2
h
1
col2
col1
REVIEW
1f
1b
1a
1e
1c
1d
1h
B9
B1
S3
S2
S1
(5G)

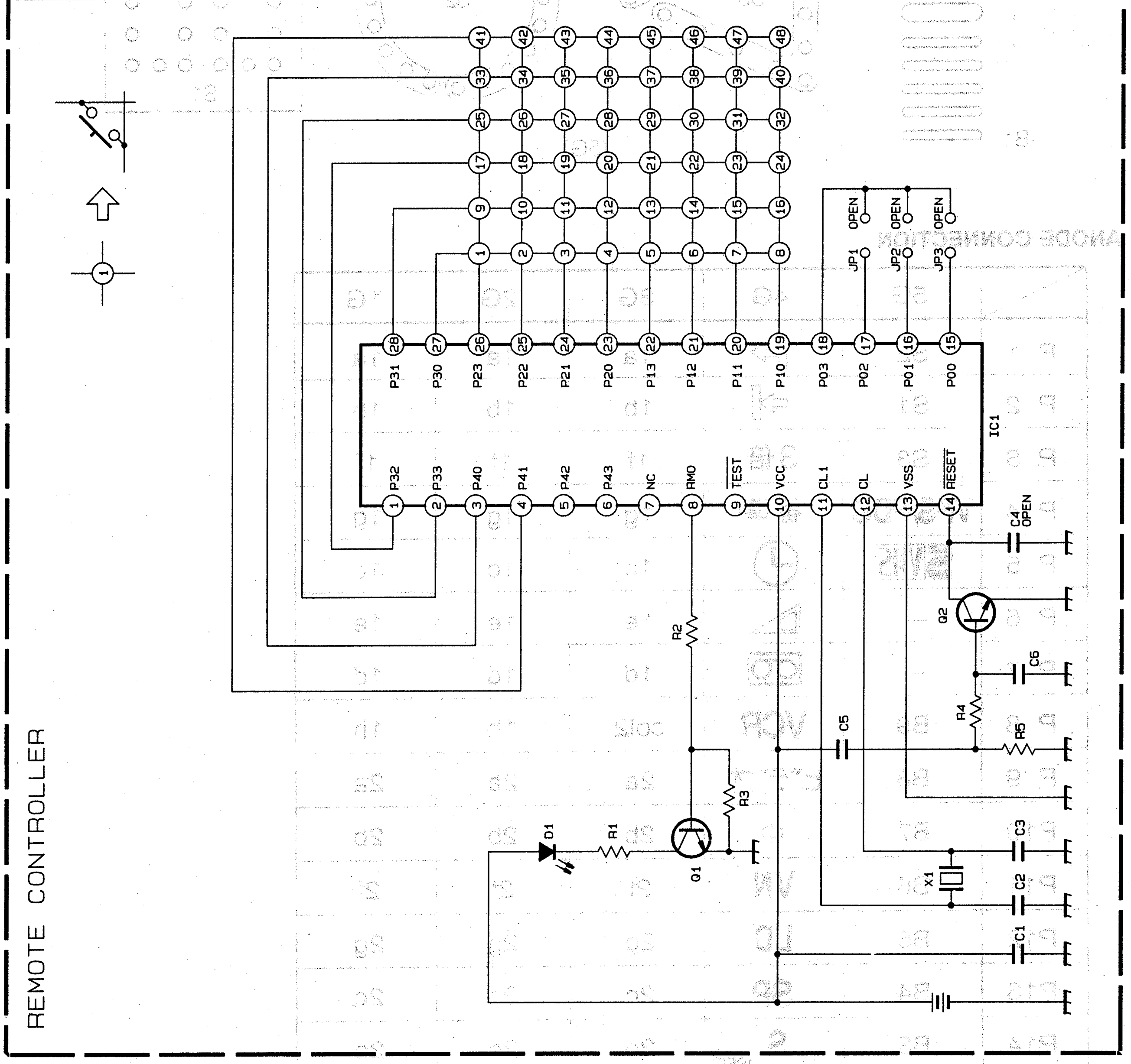
ANODE CONNECTION

	5G	4G	3G	2G	1G
P 1	S2	↦	1a	1a	1a
P 2	S1	⇥	1b	1b	1b
P 3	S3	3倍	1f	1f	1f
P 4	**VPS/PDC**	標準	1g	1g	1g
P 5	**S VHS**	🕒	1c	1c	1c
P 6	—	◺	1e	1e	1e
P 7	—	📼	1d	1d	1d
P 8	B9	**VCR**	col2	1h	1h
P 9	B8	ビデオ	2a	2a	2a
P10	B7	⇨	2b	2b	2b
P11	B6	**VN**	2f	2f	2f
P12	B5	**LD**	2g	2g	2g
P13	B4	**SP**	2c	2c	2c
P14	B3	**S** (SEP)	2e	2e	2e
P15	B2	**:** (SEP)	2d	2d	2d
P16	B1	**LP** (SEP)	2h	col1	**REVIEW**

4.15 REMOTE CONTROL SCHEMATIC DIAGRAM

NOTES:
1.All parts shown in this schematic are critical for safety.
2.This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

Key No.	Key Name
1	START+
2	DIGIT1
3	DIGIT4
4	STOP+
5	DATE+
6	CH+
7	DIGIT3
8	DIGIT6
9	CANCEL/C.RESET
10	DIGIT2
11	DIGIT7
12	DIGIT0
13	DIGIT8
14	TIMER
15	DIGIT5
16	DIGIT9
17	PROG.
18	CABLE/DSS
19	TV
20	PROG CHECK
21	SP/EP
22	SKIP SEARCH
23	POWER
24	MBR SET/A/B
25	START-
26	TV/VCR
27	RE-VIRE
28	STOP-
29	DATE-
30	CH-
31	DISPLAY
32	ENTER/OSD
33	MENU
34	REC
35	REW
36	PLAY
37	STOP
38	FF
39	PAUSE/STILL
40	OK
41	<</TV VOL-
42	--
43	--
44	--
45	^/TV CH+
46	v/TV CH-
47	--
48	<</TV VOL-
34+36	REC START
34+39	REC PAUSE


REMOTE CONTROLLER
IC1
P31
P30
P23
P22
P21
P20
P13
P12
P11
P10
P03
P02
P01
P00
P32
P33
P40
P41
P42
P43
NC
RMO
TEST
VCC
CL1
CL
VSS
RESET
JP1
JP2
JP3
OPEN
C4 OPEN
Q1
Q2
R1
R2
R3
R4
R5
C1
C2
C3
C5
C6
D1
X1

4.16 VOLTAGE CHARTS

<VIDEO/N.AUDIO>

MODE PIN NO.	REC	PLAY
IC1		
1	2.4	2.4
2	2.4	2.4
3	0	0
4	2.7	2.5
5	0	0
6	0.5	1.0
7	-	-
8	-	-
9	2.4	2.4
10	2.4	2.4
11	2.4	2.4
12	5.0	5.0
13	1.8	1.6
14	1.8	1.5
15	0	3.0
16	1.8	0.8
17	2.7	2.7
18	2.3	2.1
19	3.0	3.0
20	2.6	2.6
21	2.2	2.2
22	2.3	2.0
23	2.9	2.9
24	2.0	2.0
25	1.3	1.3
26	2.0	2.0
27	0	0
28	2.9	2.9
29	1.8	1.8
30	2.7	2.7
31	2.7	2.7
32	0	0
33	0	0
34	0	0
35	3.1	3.1
36	5.0	5.0
37	4.8	4.8
38	5.0	5.0
39	3.1	3.1
40	5.0	5.0
41	5.0	5.0
42	2.1	2.1
43	5.0	5.0
44	2.7	2.7
45	0	0
46	2.1	2.1
47	0	0
48	0	0
49	0	0
50	0.3	0.3
51	0	0.8
52	2.4	2.4
53	2.8	2.8
54	1.9	1.9
55	2.0	2.0
56	2.7	2.7
57	4.9	4.9
58	3.1	3.1
59	3.1	3.1
60	2.0	2.0
61	4.8	4.8
62	5.0	5.0
63	5.0	5.0
64	0	0
65	1.6	1.6
66	4.9	4.9
67	4.8	4.8
68	0	0
69	2.7	2.7
70	2.6	2.6
71	-	-
72	2.2	2.2
73	-	-
74	2.6	1.0
75	0.9	0.9
76	2.6	2.6
77	-	-
78	2.7	2.7
79	3.9	2.0
80	0	0
81	2.6	2.6
82	1.1	1.1
83	2.6	2.6
84	0	0
85	0	0
86	2.0	2.0
87	2.3	2.1
88	2.3	2.1
89	2.0	2.0
90	4.9	4.9
91	0	0
92	0	0
93	0	0
94	0	0
95	2.8	2.8
96	5.0	5.0
97	0	0
98	2.0	2.4
99	0.5	2.7
100	2.4	2.4
Q9		
E	2.9	2.9
C	0	0
B	2.2	2.2
Q31		
E	0	0
C	0.7	0.5
B	0	0
Q38		
E	1.7	1.7
C	4.8	4.8
B	2.4	2.4
Q39		
E	2.4	2.4
C	0	0
B	1.8	1.8
Q2001		
E	-13.5	0
C	0	0
B	-20.1	0.7
Q2002		
E	-13.5	0
C	0	0
B	-19.7	0.7
Q2003		
E	5.1	5.1
C	-19.8	5.0
B	5.2	0
Q2051		
E	0	0
C	8.2	0
B	0.4	0.4
Q2052		
E	11.7	11.7
C	11.5	2.6
B	10.9	11.7
Q2053		
E	0	0
C	0	11.6
B	5.2	0
Q2054		
E	11.5	2.6
C	11.3	0.3
B	10.7	2.6
Q2055		
E	0	0
C	0	2.6
B	5.1	0
Q2103		
E	1.7	1.7
C	5.1	5.1
B	2.3	2.3
CN1		
1	0	0
2	0	0
3	0	0
4	0	0
5	2.0	2.2
6	2.0	2.2
7	2.0	2.2
8	2.0	2.2
9	4.3	0
10	4.3	0
11	4.3	0
CN2001		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	2.3	2.5
7	2.6	2.6
CN2002		
1	0	0
2	0	0

<ON SCREEN>

MODE PIN NO.	REC	PLAY
IC201		
1	0	0
2	2.8	2.8
3	5.2	5.2
4	5.3	5.3
5	0	0
6	2.6	2.6
7	2.6	2.6
8	5.4	5.4
9	1.0	1.0
10	4.9	4.9
11	5.1	5.1
12	5.4	5.4
13	2.2	1.6
14	0	0
15	2.2	1.3
16	5.4	5.4
17	3.2	3.2
18	3.9	3.9
19	-	-
20	5.4	5.4
21	5.3	5.3
22	5.3	5.3
23	5.4	5.4
24	5.4	5.4
Q207		
E	-	-
C	-	-
B	-	-

<FMA>

MODE PIN NO.	REC	PLAY
IC2201		
1	0.7	0.7
2	0	0
3	2.5	2.5
4	0	0
5	0	0
6	-	-
7	2.5	2.5
8	2.6	2.6
9	1.4	1.4
10	0	0
11	2.5	2.5
12	2.5	2.5
13	2.5	2.5
14	2.0	2.0
15	2.6	0
16	5.1	5.1
17	5.0	5.0
18	0	2.6
19	0	0
20	0	1.8
21	2.0	2.0
22	-	-
23	0	0
24	2.0	2.0
25	2.5	2.5
26	2.5	2.5
27	2.5	2.5
28	0	0
29	1.6	1.6
30	2.6	2.6
31	5.0	5.0
32	2.5	2.5
33	-	-
34	0	0
35	0	0
36	0.7	0.7
37	2.5	2.5
38	2.5	2.5
39	9.8	9.8
40	0.5	0.5
41	4.5	4.5
42	0	0
43	0	0
44	0	0
45	4.4	4.4
46	4.5	4.5
47	1.7	1.7
48	0.3	0
IC2251		
1	0	2.6
2	4.3	0
3	0.5	0.5
4	0	0
5	0.5	0.5
6	4.3	0
7	4.3	0
8	0	0
9	0.6	0
10	5.0	5.0
11	3.2	3.2
12	0	0
13	1.8	0.9
14	1.9	1.9
15	0.7	0
16	5.1	1.0
Q2251		
E	5.1	0
C	5.1	1.0
B	0.5	0.5

<SYSCON>

MODE PIN NO.	REC	PLAY
IC3001		
1	2.5	2.5
2	5.1	5.1
3	5.0	5.0
4	5.0	5.0
5	5.2	5.2
6	-	-
7	-	-
8	0	1.8
9	0	1.8
10	4.7	4.7
11	-	-
12	0	0
13	5.2	0
14	5.3	5.3
15	5.3	5.3
16	-	-
17	0	0
18	2.6	2.6
19	0	2.6
20	-	-
21	0	0
22	-	-
23	-	-
24	-	-
25	-	-
26	0	0
27	0	0
28	0	0
29	-	-
30	5.2	5.2
31	5.3	5.3
32	5.3	5.3
33	0	0
34	0	0
35	0	0
36	5.3	5.3
37	5.3	5.3
38	-	-
39	-	-
40	0	0
41	-	-
42	-	-
43	5.3	5.3
44	5.2	5.2
45	0	0
46	0	0
47	0	0
48	5.2	5.2
49	-	-
50	0	0
51	5.3	5.3
52	5.3	5.3
53	0	0
54	0	5.3
55	0	0
56	0	0
57	5.3	5.3
58	0	0
59	0	0
60	5.2	5.2
61	5.3	5.3
62	0	5.3
63	5.2	0
64	1.0	1.0
65	5.2	5.2
66	4.2	4.2
67	5.3	5.3
68	5.0	5.0
69	5.3	5.3
70	4.9	4.9
71	5.0	5.0
72	5.0	5.0
73	5.2	5.2
74	0	0
75	0	0
76	5.2	5.2
77	2.5	2.5
78	1.4	1.4
79	-	-
80	-	-
81	5.3	5.3
82	1.3	3.2
83	-	-
84	0.7	0.7
85	2.5	2.5
86	0.6	0.6
87	1.9	1.9
88	0	0
89	2.5	2.5
90	-	-
91	2.0	2.5
92	3.0	2.5
93	2.5	2.5
94	2.4	2.4
95	2.5	2.5
96	2.5	2.5
97	2.4	2.4
98	5.0	5.0
99	5.0	5.0
100	0	0
IC3002		
1	0	0
2	12.5	12.5
3	0.6	0.6
4	-	-
5	0	0
6	12.5	12.5
7	0.6	0.6
8	12.5	12.5
9	0	0
IC3003		
1	5.3	5.3
2	5.2	5.2
3	0	0
IC3004		
1	0	0
2	0	0
3	0	0
4	0	0
5	5.1	5.1
6	5.1	5.1
7	0	0
8	5.3	5.3
Q3001		
E	0	0
C	5.2	5.2
B	-	-
Q3002		
E	0	0
C	5.2	5.2
B	-	-
Q3003		
E	0	0
C	12.4	12.4
B	0	0
Q3004		
E	0	0
C	0	0
B	0.7	0.7
Q3005		
E	0	0
C	5.1	5.1
B	0	0
Q4001		
E	0	0
C	0	0
B	5.2	5.2
Q4002		
E	5.0	5.0
C	6.0	6.0
B	5.7	5.7
CN3001		
1	0	0
2	2.5	2.5
3	2.5	2.5
4	5.1	5.1
5	0	0
6	5.3	5.3
7	-	-
8	12.5	12.5
CN3002		
1	1.5	1.5
2	0.6	0.6
3	12.5	12.5
4	1.9	1.9
5	0	0
CN3003		
1	0.6	0.6
2	0.6	0.6
CN3004		
1	5.2	5.2
2	5.2	5.2
3	0	0
4	0	0
CN3005		
1	5.3	5.3
2	5.3	5.3
FW3001		
1	5.1	5.1
2	0	0
FW3002		
1	0	0
2	0	0

<SWITCHING REG.>

MODE PIN NO.	REC	PLAY
IC5301		
1	6.0	6.0
2	5.1	5.1
3	4.9	5.1
4	0	0
5	12.3	12.3
6	11.6	11.6
7	12.4	12.4
8	12.4	12.4
9	1.2	1.2
10	11.1	11.1
Q5101		
S	78.4	78.4
D	89.3	88.8
G	76.3	76.3
Q5102		
E	78.5	78.5
C	76.2	76.2
B	78.1	78.1

<TUNER>

MODE PIN NO.	REC	PLAY
IC6501		
1	8.9	8.9
2	4.5	4.5
3	4.4	4.4
4	4.4	4.4
5	4.4	4.4
6	4.5	4.5
7	4.4	4.4
8	4.4	4.4
9	5.4	5.4
10	1.9	1.9
11	3.2	3.2
12	4.4	4.4
13	4.4	4.4
14	0	0
15	5.1	5.1
16	5.1	5.1
17	0	0
18	4.4	4.4
19	4.6	4.6
20	4.5	4.5
21	1.2	1.2
22	5.1	5.1
23	5.1	5.1
24	4.4	4.4
25	4.5	4.5
26	4.4	4.4
27	4.5	4.5
28	3.6	3.6
Q6001		
1(E)	9.0	9.0
2(C)	11.7	11.7
3(B)	9.6	9.6
Q6031		
E	0	0
C	0	0
B	4.3	4.3

<SW/DISPLAY>

MODE PIN NO.	REC	PLAY
IC7001		
1	5.3	5.3
2	2.1	2.1
3	0	0
4	2.1	2.1
5	5.3	5.3
6	5.3	5.3
7	4.2	4.2
8	4.2	4.2
9	3.2	3.2
10	4.7	4.7
11	5.3	5.3
12	4.2	4.2
13	5.1	5.1
14	5.3	5.3
15	4.9	4.9
16	-29.1	-29.1
17	-29.1	-29.1
18	-	-
19	-	-
20	-	-
21	-	-
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	-	-
37	-	-
38	-	-
39	-	-
40	-	-
41	-	-
42	-	-
43	-	-
44	5.3	5.3
IC7002		
1	5.3	5.3
2	5.3	5.3
3	0	0

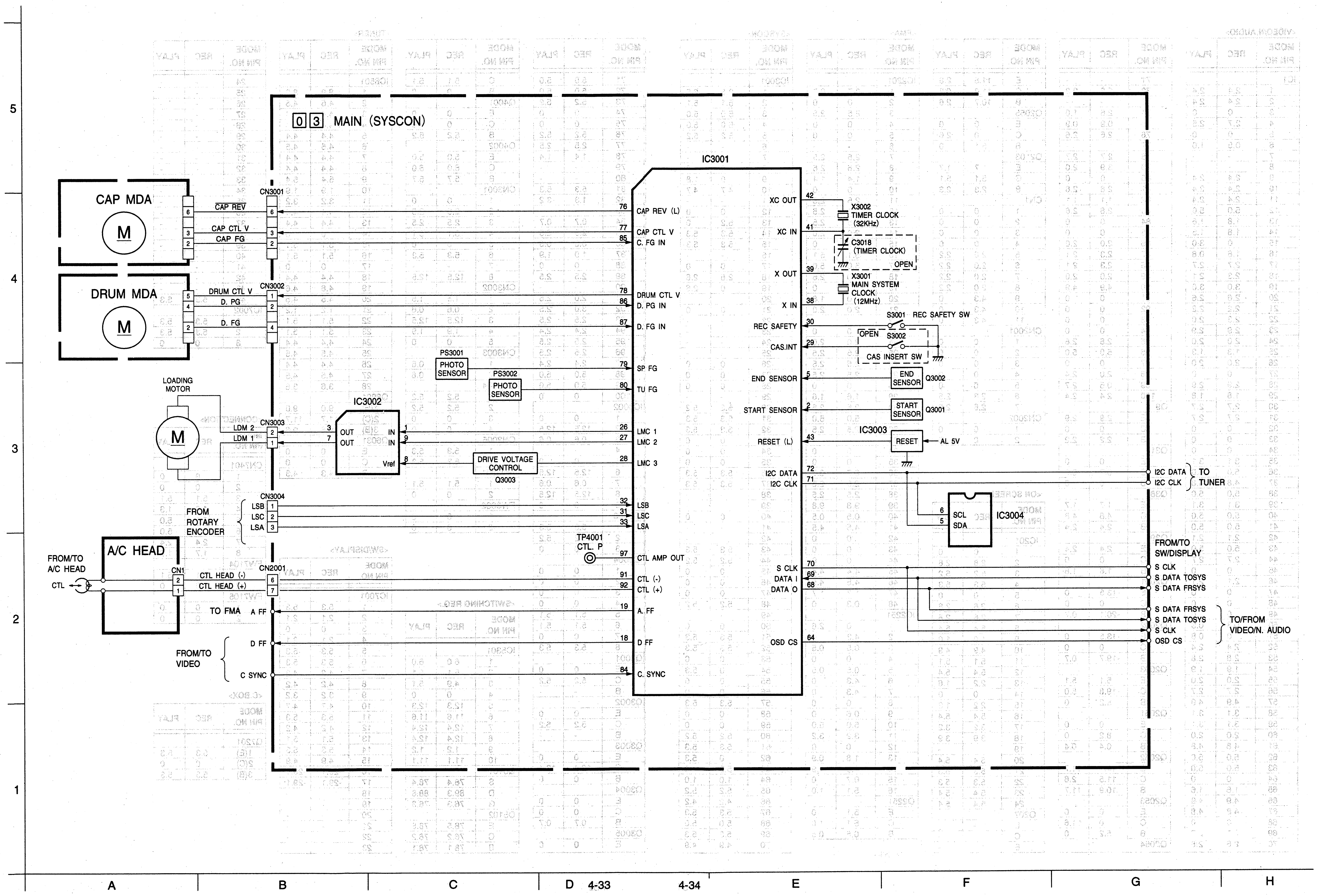
<CONNECTION>

MODE PIN NO.	REC	PLAY
CN7401		
1	0	0
2	0	0
3	5.1	5.1
4	1.3	1.3
5	5.0	5.0
6	-	5.0
7	2.4	2.4
8	1.7	1.7
FW7104		
1	5.1	5.1
2	0	0
FW7105		
1	0	0
2	0	0

<C.BOX>

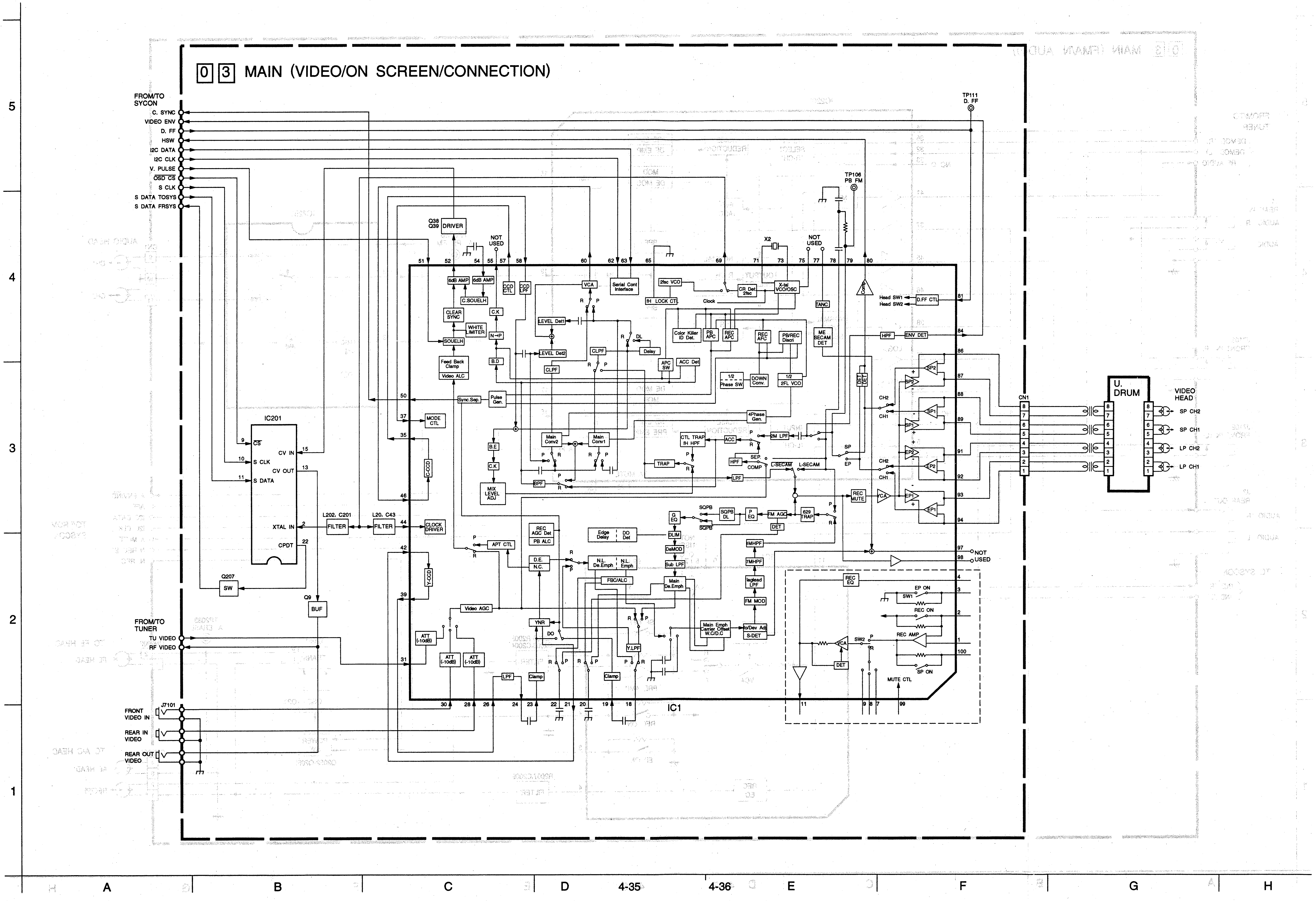
MODE PIN NO.	REC	PLAY
Q7201		
1(E)	5.3	5.3
2(C)	0	0
3(B)	5.3	5.3

4.17 SYSTEM CONTROL BLOCK DIAGRAM



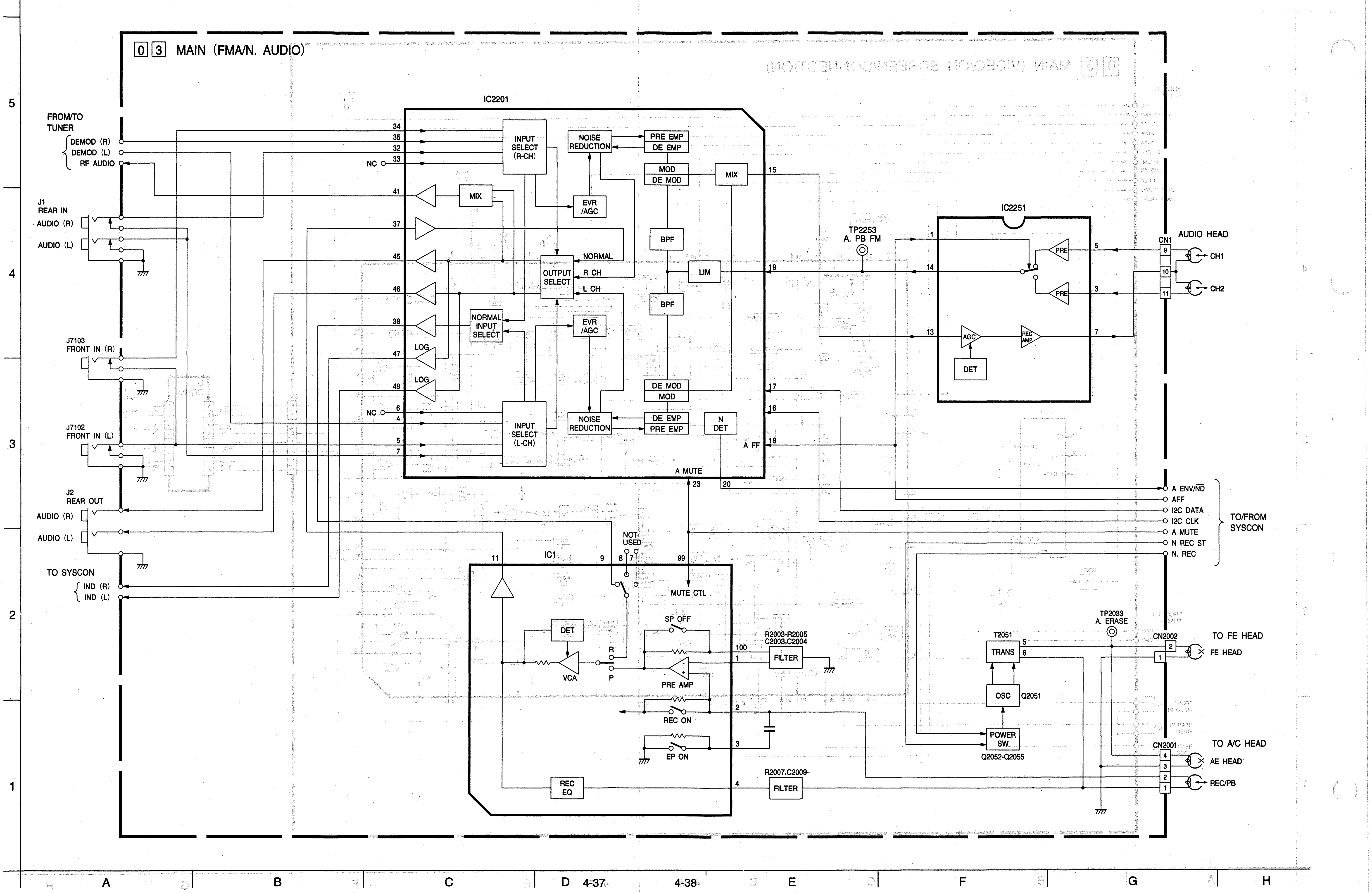
03 MAIN (SYSCON)
IC3001
CAP MDA
M
6
3
2
CN3001
CAP REV
CAP CTL V
CAP FG
76 CAP REV (L)
77 CAP CTL V
85 C. FG IN
DRUM MDA
M
5
4
2
CN3002
DRUM CTL V
D. PG
D. FG
1
2
4
78 DRUM CTL V
86 D. PG IN
87 D. FG IN
PS3001 PHOTO SENSOR
PS3002 PHOTO SENSOR
79 SP FG
80 TU FG
LOADING MOTOR
M
CN3003
LDM 2
LDM 1
IC3002
3 OUT
7 OUT
1 IN
9 IN
8 Vref
DRIVE VOLTAGE CONTROL
Q3003
26 LMC 1
27 LMC 2
28 LMC 3
CN3004
LSB 1
LSC 2
LSA 3
FROM ROTARY ENCODER
32 LSB
31 LSC
33 LSA
TP4001 CTL. P
97 CTL AMP OUT
A/C HEAD
FROM/TO A/C HEAD
CTL
CN1
2
1
CN2001
CTL HEAD (-)
CTL HEAD (+)
6
7
91 CTL (-)
92 CTL (+)
TO FMA
A FF
19 A. FF
FROM/TO VIDEO
D FF
C SYNC
18 D FF
84 C. SYNC
42 XC OUT
X3002 TIMER CLOCK (32KHz)
41 XC IN
C3018 (TIMER CLOCK)
OPEN
39 X OUT
X3001 MAIN SYSTEM CLOCK (12MHz)
38 X IN
S3001 REC SAFETY SW
30 REC SAFETY
OPEN S3002
CAS INSERT SW
29 CAS.INT
5 END SENSOR
END SENSOR Q3002
2 START SENSOR
START SENSOR Q3001
IC3003
43 RESET (L)
RESET
AL 5V
72 I2C DATA
71 I2C CLK
IC3004
6 SCL
5 SDA
I2C DATA
I2C CLK
TO TUNER
FROM/TO SW/DISPLAY
70 S CLK
69 DATA I
68 DATA O
S CLK
S DATA TOSYS
S DATA FRSYS
S DATA FRSYS
S DATA TOSYS
S CLK
64 OSD CS
OSD CS
TO/FROM VIDEO/N. AUDIO
5
4
3
2
1
A
B
C
D
E
F
G
H

4.18 VIDEO BLOCK DIAGRAM



0 3 MAIN (VIDEO/ON SCREEN/CONNECTION)
FROM/TO SYCON
C. SYNC
VIDEO ENV
D. FF
HSW
I2C DATA
I2C CLK
V. PULSE
OSD CS
S CLK
S DATA TOSYS
S DATA FRSYS
TP111 D. FF
TP106 PB FM
Q38 Q39 DRIVER
NOT USED
X2
IC201
CS
CV IN
S CLK
CV OUT
S DATA
XTAL IN
CPDT
L202, C201 FILTER
L20, C43 FILTER
Q207 SW
Q9 BUF
FROM/TO TUNER
TU VIDEO
RF VIDEO
J7101
FRONT VIDEO IN
REAR IN VIDEO
REAR OUT VIDEO
IC1
6dB AMP
C.SOUELH
CLEAR SYNC
WHITE LIMITER
SOUELH
Feed Back Clamp
Video ALC
CCD CTL
CCD LPF
C.K
N→P
B.D
VCA
LEVEL Det1
LEVEL Det2
CLPF
Serial Cont Interface
2fsc VCO
fH LOCK CTL
CR Det 2fsc
Clock
X-tal VCO/OSC
Color Killer ID Det.
PB APC
REC APC
REC AFC
PB/REC Discri
ME SECAM DET
TANC
Comb
APC SW
ACC Det
1/2 Phase SW
DOWN Conv.
1/2 2FL VCO
Delay
DL
Sync.Sep
Pulse Gen.
MODE CTL
C-CCD
4Phase Gen.
B.E
Main Conv2
Main Conv1
CTL TRAP fH HPF
ACC
2M LPF
TRAP
HPF
SEP
COMP
L-SECAM
LPF
BPF
MIX LEVEL ADJ
CLOCK DRIVER
REC AGC Det
PB ALC
APT CTL
Edge Delay
DO Det
G EQ
SQPB
SQPB DL
P EQ
FM AGC
629 TRAP
DET
REC MUTE
DLIM
DeMOD
Sub LPF
Main De.Emph
D.E.
N.C.
N.L. De.Emph
N.L. Emph
FBC/ALC
Y-CCD
Video AGC
YNR
DO
Y.LPF
Main Emph Carrier Offset W.C/D.C
fo/Dev Adj
S-DET
fMHPF
7MHPF
lagleadLPF
FM MOD
ATT (-10dB)
LPF
Clamp
REC EQ
EP ON
SW1
REC ON
REC AMP
SW2
SP ON
MUTE CTL
Head SW1
Head SW2
D.FF CTL
ENV DET
SP1
SP2
EP1
EP2
CH1
CH2
SP
EP
NOT USED
CN1
U. DRUM
VIDEO HEAD
SP CH2
SP CH1
LP CH2
LP CH1
R
P
A
B
C
D
E
F
G
H
1
2
3
4
5

4.19 AUDIO BLOCK DIAGRAM

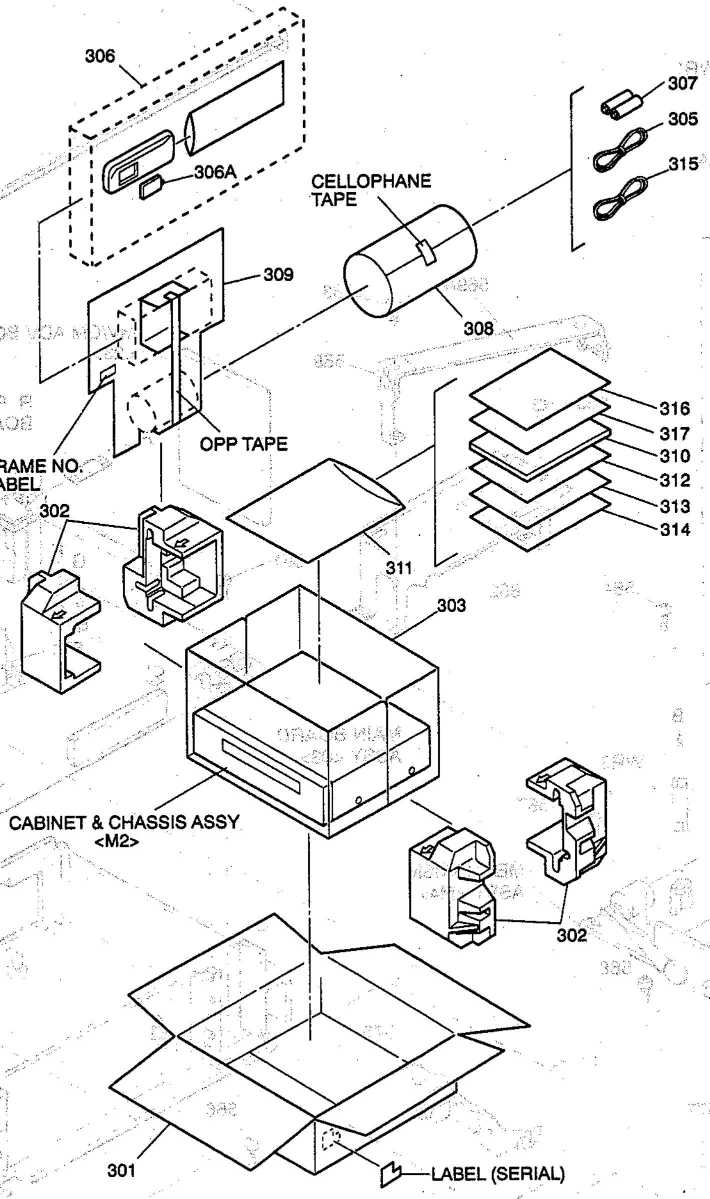

0 3 MAIN (FMA/N. AUDIO)
IC2201
FROM/TO TUNER
DEMOD (R)
DEMOD (L)
RF AUDIO
J1 REAR IN
AUDIO (R)
AUDIO (L)
J7103 FRONT IN (R)
J7102 FRONT IN (L)
J2 REAR OUT
AUDIO (R)
AUDIO (L)
TO SYSCON
IND (R)
IND (L)
NC
NC
34
35
32
33
41
37
45
46
38
47
48
6
4
5
7
LOG
LOG
MIX
INPUT SELECT (R-CH)
NOISE REDUCTION
PRE EMP
DE EMP
MOD
DE MOD
MIX
EVR /AGC
NORMAL
R CH
L CH
OUTPUT SELECT
NORMAL INPUT SELECT
EVR /AGC
BPF
LIM
BPF
DE MOD
MOD
INPUT SELECT (L-CH)
NOISE REDUCTION
DE EMP
PRE EMP
N DET
A FF
A MUTE
15
19
17
16
18
23
20
TP2253 A. PB FM
IC2251
1
14
13
5
3
7
PRE
PRE
AGC
REC AMP
DET
CN1
9
10
11
AUDIO HEAD
CH1
CH2
A ENV/N̅D̅
AFF
I2C DATA
I2C CLK
A MUTE
N REC ST
N. REC
TO/FROM SYSCON
NOT USED
IC1
11
9
8
7
99
MUTE CTL
DET
VCA
R
P
SP OFF
PRE AMP
REC ON
EP ON
REC EQ
100
1
2
3
4
R2003-R2005 C2003,C2004
FILTER
R2007,C2009
FILTER
TP2033 A. ERASE
T2051
TRANS
5
6
OSC
Q2051
POWER SW
Q2052-Q2055
CN2002
2
1
TO FE HEAD
FE HEAD
CN2001
4
3
2
1
TO A/C HEAD
AE HEAD
REC/PB
5
4
3
2
1
A
B
C
D
E
F
G
H

SECTION 5
PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>


306
306A
307
305
315
CELLOPHANE TAPE
309
308
316
317
310
312
313
314
OPP TAPE
FRAME NO. LABEL
302
311
303
CABINET & CHASSIS ASSY <M2>
302
301
LABEL (SERIAL)

****

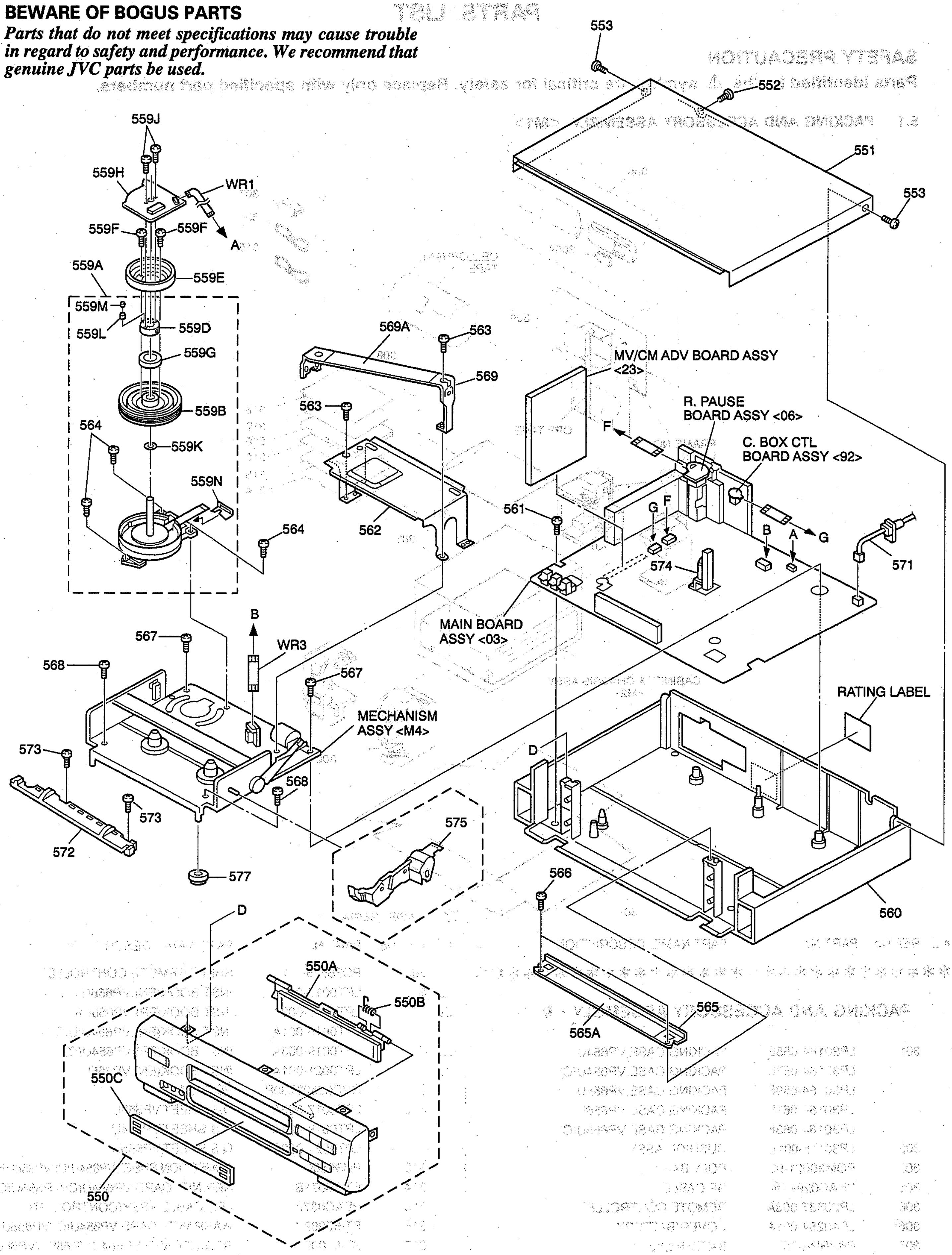
PACKING AND ACCESSORY ASSEMBLY <M1>

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	301	LP30164-055B	PACKING CASE,VP654U
		LP30164-057B	PACKING CASE,VP654U(C)
		LP30164-059B	PACKING CASE,VP655U
		LP30164-061B	PACKING CASE,VP656U
		LP30164-063B	PACKING CASE,VP656U(C)
	302	LP30115-001B	CUSHION ASSY
	303	PQM30021-93	POLY BAG
	305	PEAC0294-04	RF CABLE
	306	LP20337-003A	REMOTE CONTROLLER
	306A	LP40254-001A	COVER(BATTERY)
	307	R6PRPA-2ST	BATTERY,X2
	308	QPC02202230P	POLY BAG
	309	PQ35575-1-1	SHEET,REMOTE CONTROLLER
⚠	310	LPT0017-001A	INST BOOK(EN),VP656U/U(C)
⚠		LPT0017-003A	INST BOOK(FR),VP656U(C)
⚠		LPT0019-001A	INST BOOK(EN),VP654U/U(C)
⚠		LPT0019-003A	INST BOOK(FR),VP654U(C)
⚠		LPT0021-001A	INST BOOK(EN),VP655U
	311	QPC02503530P	POLY BAG
	312	LPT0017-002A	Q.S.SHEET,VP656U
		LPT0019-002A	Q.S.SHEET,VP654U
		LPT0021-002A	Q.S.SHEET,VP655U
	313	PU36560	CONECTION SHEET,VP654U(C)/VP656U(C)
	314	BT-20071B	SER.NET CARD,VP654U(C)/VP656U(C)
	315	PEAC0370	LED CABLE ASSY(CONTROLLER)
	316	BT-52002-1	WARRANTY CARD,VP654U(C)/VP656U(C)
	317	BT-51006-1	REGIST.CARD,VP654U/VP655U/VP656U

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



553
552
551
553
559J
559H
WR1
559F
559F
A
559A
559E
559M
559D
559L
559G
559B
564
559K
559N
564
569A
563
569
563
562
MV/CM ADV BOARD ASSY <23>
R. PAUSE BOARD ASSY <06>
C. BOX CTL BOARD ASSY <92>
F
561
G
F
B
A
G
574
571
MAIN BOARD ASSY <03>
B
WR3
567
568
567
MECHANISM ASSY <M4>
568
573
573
572
577
575
RATING LABEL
D
566
560
D
550A
550B
550C
550
565
565A

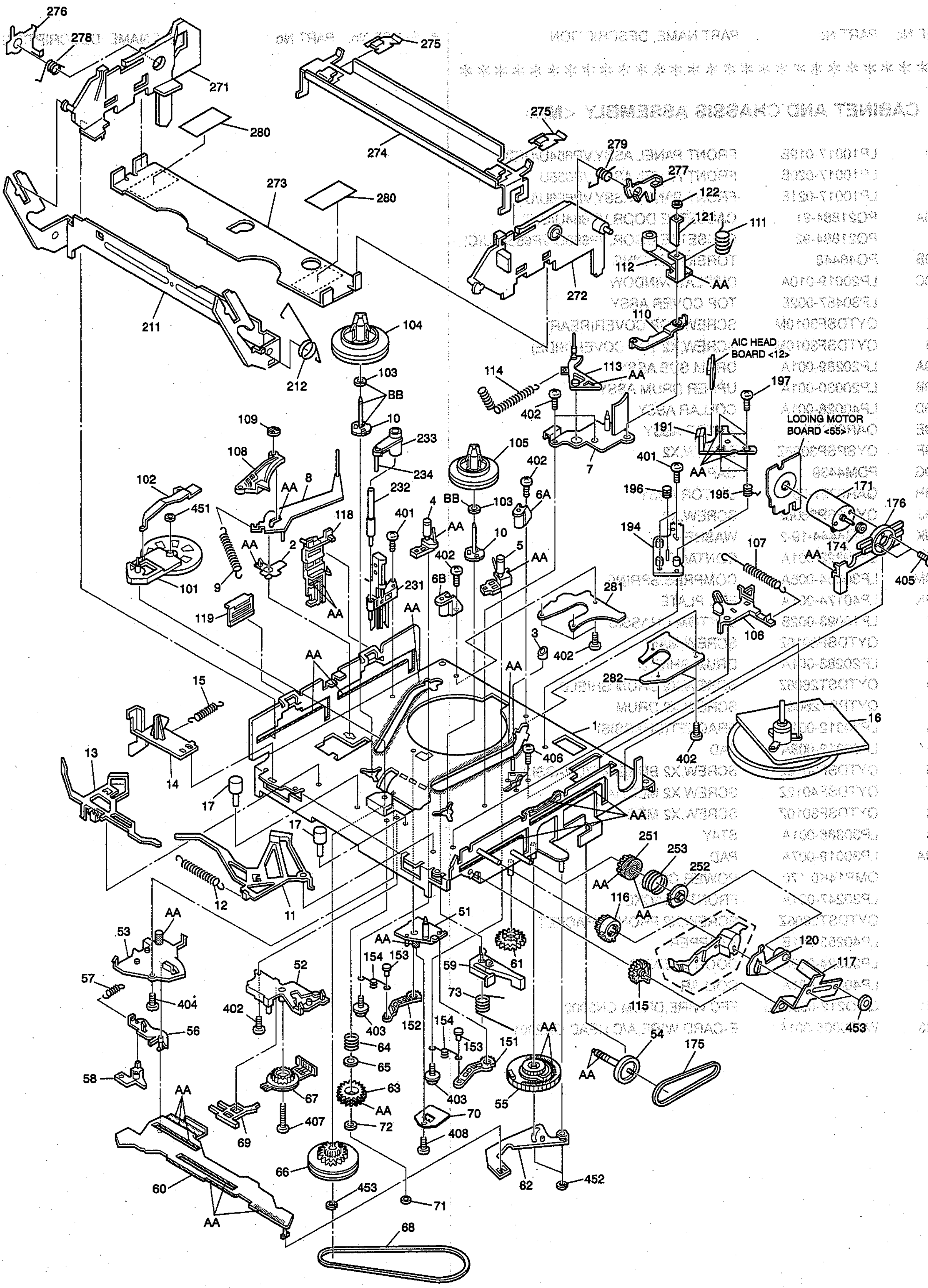
# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

CABINET AND CHASSIS ASSEMBLY <M2>

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	550	LP10017-019B	FRONT PANEL ASSY,VP654U/U(C)
		LP10017-020B	FRONT PANEL ASSY,VP655U
		LP10017-021B	FRONT PANEL ASSY,VP656U/U(C)
	550A	PQ21884-91	CASSETTE DOOR,VP654U/U(C)
		PQ21884-92	CASSETTE DOOR,VP655U/VP656U/U(C)
	550B	PQ46448	TORSION SPRING
	550C	LP20019-010A	DISPLAY WINDOW
	551	LP30457-002B	TOP COVER ASSY
	552	QYTDSF3010M	SCREW,TOP COVER(REAR)
	553	QYTDSF3010M	SCREW,X2 TOP COVER(SIDE)
	559A	LP20289-001A	DRUM SUB ASSY
	559B	LP20030-001A	UPPER DRUM ASSY
	559D	LP40028-001A	COLLAR ASSY
	559E	QAR0020-001	ROTOR ASSY
	559F	QYSPSP3006Z	SCREW,X2
	559G	PDM4439	CAP
	559H	QAR0021-001	STATOR ASSY
	559J	QYSPSP2606Z	SCREW,X2
	559K	PDM4444-19-2	WASHER
	559L	LP40323-001A	CONTACT
	559M	LP30004-005A	COMPRES.SPRING
	559N	LP40174-001A	FPC PLATE
⚠	560	LP10093-002B	BOTTOM CHASSIS
	561	QYTDSF3010Z	SCREW,MAIN
	562	LP20283-001A	DRUM SHIELD
	563	QYTDST2606Z	SCREW,X2 DRUM SHIELD
	564	QYTPST2608Z	SCREW,X3 DRUM
	565	LP30312-001A	BRACKET(CHASSIS)
	565A	LP30019-008A	PAD
	566	QYTDSF3010Z	SCREW,X2 BRACKET(CHASSIS)
	567	QYTDSF4012Z	SCREW,X2 MECHA
	568	QYTDSF3010Z	SCREW,X2 MECHA
	569	LP30386-001A	STAY
	569A	LP30019-007A	PAD
⚠	571	QMP14K0-170	POWER CORD
	572	LP30247-001A	FRONT BRACKET
	573	QYTDST2606Z	SCREW,X2 FRONT BRACKET
	574	LP40253-001B	STOPPER
	575	LP20324-002B	DOOR OPENER
	577	LP40368-001A	COLLAR
	WR1	QUQ212-0520CG	FFC WIRE,DRUM CN3002
	WR3	WJT0005-001A	E-CARD WIRE,A/C HEAD CN2001

5.3 MECHANISM ASSEMBLY <M4>


276
278
271
275
280
274
273
280
275
279
277
122
121
111
112
AA
272
211
212
104
103
BB
10
110
AIC HEAD BOARD <12>
113
AA
114
197
402
LODING MOTOR BOARD <55>
191
AA
109
233
108
234
105
402
7
401
102
8
AA
232
4
BB
103
6A
196
195
171
176
451
118
401
AA
10
194
174
AA
9
AA
2
402
5
AA
107
405
101
231
6B
281
119
AA
AA
106
3
402
AA
282
15
16
1
13
406
402
14
17
AA
251
253
17
252
12
11
AA
116
AA
51
53
AA
154
153
61
120
117
52
59
57
404
402
73
115
453
152
154
56
403
64
151
54
175
153
65
58
AA
63
403
AA
67
55
70
AA
407
72
69
408
66
62
452
453
60
71
AA
68

Classifi-cation	Part No.	Symbol in drawing
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

****

MECHANISM ASSEMBLY <M4>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
		1	LP20228-004C	MAIN DECK ASSY
		2	LP30232-002A	T.ARM BEARING
		3	LP40097-001B	G.POLE CAP
		4	LP40101-002A	POLE BASE ASSY(S)
		5	LP40104-002A	POLE BASE ASSY(T)
		6A	LP40096-002A	UV CATCHER
		6B	LP30409-001A	UV CATCHER2
		7	LP20234-001B	LID GUIDE
		8	LP40108-001A	TENSION ARM ASSY
		9	LP30003-001A	TENSION SPRING
		10	LP40123-001A	REEL SHAFT,X2
		11	LP40111-002A	MAIN BRAKE ASSY(TAKE-UP)
		12	LP30003-007B	TENSION SPRING
		13	LP40110-002C	MAIN BRAKE ASSY (SUPPLY)
		14	LP30245-001A	REC SAFTY LEVER
		15	LP30003-004A	TENSION SPRING
		16	QAR0018-002	CAPSTAN MOTOR
		17	PQ46302-1-3	ADJUST PIN,X2
		51	LP30223-003A	LOADING ARM GEAR SHAFT
		52	LP20233-003A	R.ENCODER GUIDE
		53	LP30226-003A	CTL.PLATE GUIDE
		54	LP40120-001A	WORM GEAR
		55	LP30229-001A	CTL.CAM
		56	LP30249-002B	T.UP LEVER
		57	LP30003-006A	TENSION SPRING
		58	LP40119-002A	T.UP HEAD
		59	LP40113-001A	C.BRAKE ASSY
		60	LP10080-002D	CTL.PLATE
		61	LP30237-002A	CASSETTE GEAR
		62	LP40107-002A	LINK LEVER ASSY
		63	LP40122-001A	DIRECT GEAR
		64	LP40224-001B	COMPRESSION SPRING
		65	LP30017-002A	SPACER
		66	LP40115-002C	CLUTCH UNIT
		67	QSW0554-002	ROTARY ENCODER
		68	LP30005-005A	BELT
		69	LP30235-002A	CHANGE LEVER
		70	LP40379-001A	CTL BRACKET(1)
		71	LP30016-001A	SLIT WASHER,DIRECT GEAR
		72	LP30017-006A	SPACER,DIRECT GEAR
		73	LP40355-001B	TORSION SPRING(C.BRAKE)
		101	LP40114-001C	IDLER ARM ASSY
		102	LP30236-002A	IDLER LEVER
		103	LP30017-004A	SPACER,X2 REEL DISK
		104	LP20237-001A	REEL DISK (SUPPLY)
		105	LP20238-001A	REEL DISK (TAKE-UP)
		106	LP40112-001D	S.BRAKE(T)ASSY
		107	LP40357-001B	TENSION SPRING
		108	LP40109-002B	T.BRAKE ASSY
		109	PQ46302-1-3	ADJUST PIN
		110	LP40149-001B	P.LEVER ASSY
		111	LP40148-001A	TORSION SPRING
		112	LP40105-001A	P.R.ARM ASSY
		113	LP40106-001B	GUIDE ARM ASSY
		114	LP40134-001A	TENSION SPRING
		115	LP30243-001A	DRIVE GEAR
		116	LP30242-001A	RELAY GEAR
		117	LP40214-001A	C.H.BRACKET
		118	LP30244-001B	GUIDE RAIL
		119	LP40118-001A	RAIL CAP
		120	LP30339-001A	OPENER GUIDE
		121	LP40382-001A	P.R.SHEET,P.R.ARM
		122	LP30016-002A	SLIT WASHER,P.R.ARM
		151	LP40103-002A	LOADING ARM GEAR(T)
		152	LP30224-001A	LOADING ARM GEAR(S)
		153	LP40100-001A	PIN,LODING ARM(S)
			LP40100-001A	PIN,LODING ARM(T)
		154	LP40099-001A	TORSION ARM,L.ARM GEAR(T)
			LP40099-001A	TORSION ARM,L.ARM GEAR(S)
		171	PU60628-3-2	LOADING MOTOR
		174	PQ43546-1-2	MOTOR PULLEY
		175	LP30005-003A	BELT
		176	LP30230-001B	MOTOR GUIDE
		191	QAH0010-002	AC HEAD
		194	LP30228-001A	HEAD BASE
		195	LP30004-004A	COMPRESSION SPRING,X3
		196	LP40236-001A	COMPRESSION SPRING
		197	LP40213-001A	SPECIAL SCREW,X3 AC HEAD
		211	LP20240-001A	DRIVE ARM
		212	LP40137-001A	TORSION SPRING
		231	NAH0001-001	FULL ERASE HEAD
		232	LP40098-001B	GUIDE POLE(S)
		233	LP30395-001B	TENSION STUD BASE
		234	LP40367-001A	TENSION STUD
		251	LP30239-002D	LIMIT GEAR(1)
		252	LP30240-002C	LIMIT GEAR(2)
		253	LP40136-001D	TORSION SPRING
		271	LP10081-001B	SIDE HOLDER(L)
		272	LP10082-001D	SIDE HOLDER(R)
		273	LP30257-001B	CASSETTE HOLDER
		274	LP20241-001C	TOP PLATE
		275	LP30258-001A	SPRING PLATE,X2
		276	LP30255-001E	LOCK LEVER(L)
		277	LP30256-001B	LOCK LEVER(R)
		278	LP40168-001A	TOR.SPRING(L)
		279	LP40218-001B	TOR.SPRING(R)
		280	LP30019-006C	PAD,X2 CASSTTE HOLDER
		281	LP40275-001A	PLATE(S)
		282	LP40276-001A	PLATE(T)
		401	QYTDST2608Z	SCREW,FULL ERASE HEAD
			QYTDST2608Z	SCREW,X2 AC HEAD
		402	QYTDST2606Z	SCREW,X2 UV CATCHR
			QYTDST2606Z	SCREW,LOADING ARM GEAR SHAFT
			QYTDST2606Z	SCREW,ROTARY ENCORDER GUIDE
			QYTDST2606Z	SCREW,X2 LID GUIDE
			QYTDST2606Z	SCREW,X3 PLATE(S)
			QYTDST2606Z	SCREW,X3 PLATE(T)
		403	QYSPSTG2606Z	SCREW,POLE BASE(S)
			QYSPSTG2606Z	SCREW,POLE BASE(T)
		404	QYTPST2605Z	SCREW,CONTROL PLATE GUIDE
		405	QYTPSP3003Z	SCREW,X2 LOADING MOTOR
		406	QYTPSF2606M	SCREW,X3 CAPSTAN MOTOR
		407	QYTPST2620Z	SCREW,ROTARY ENCODER
		408	QYTDSF2608MY	SCREW,CTL BRACKET(1)
		451	LP30016-001A	SLIT WASHER,IDLER ARM
		452	PQM30017-24	SLIT WASHER,CONTROL CAM
			PQM30017-24	SLIT WASHER,LINK LEVER
		453	PQM30017-47	SLIT WASHER,CLUTCH UNIT
			PQM30017-47	SLIT WASHER,X2 C.H.BRACKET

5.4 ELECTRICAL PARTS LIST

****

MAIN BOARD ASSEMBLY <03>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
		PW1	LPA10001-03C1	MAIN BOARD ASSY,VP654U/U(C)
			LPA10001-04C1	MAIN BOARD ASSY,VP655U/VP656U/U(C)
		IC1	HA118211NF	IC
		IC201	LC74785-9644	IC (OSD)
		IC2201	AN3665FB	IC
	⚠	IC2251	AN3328S	IC
		IC3001	M37777MAA1C2GP	IC
			or M37777EAA1C2GP	IC
		IC3002	TA7291S	IC
		IC3003	S-80727AN-Z	IC
		IC3004	X24C04P	IC
			or XL24C04P	IC
			or AT24C04-10PC	IC
			or ST24C04FB6	IC
			or 24LC04B/P	IC
		IC5301	LA5613	IC
		IC6501	UPC1854AGT	IC
		IC7001	M35500AFP	IC
			or M35500AGP	IC
			or M35500BGP	IC
		IC7002	GP1U291Q	IR DETECT UNIT
			or PIC-21143LJ	IR DETECT UNIT
			or PNA4652M00YC	IR DETECT UNIT
		Q9	2SB1218A/QR/-X	TRANSISTOR
			or 2SA1576A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		Q31	UN521E	TRANSISTOR
			or DTC144WU	TRANSISTOR
			or RN1309	TRANSISTOR
		Q38	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q39	2SB1218A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
			or 2SA1576A/QR/-X	TRANSISTOR
		Q207	UN521E	TRANSISTOR
			or RN1309	TRANSISTOR
			or DTC144WU	TRANSISTOR
		Q2001	2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
		Q2002	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q2003	UN511E	TRANSISTOR
			or DTA144WU	TRANSISTOR
			or RN2309	TRANSISTOR
		Q2051	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q2052	2SB1218A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
			or 2SA1576A/QR/-X	TRANSISTOR
		Q2053	UN521E	TRANSISTOR
			or RN1309	TRANSISTOR
			or DTC144WU	TRANSISTOR
		Q2054	2SB1218A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
			or 2SA1576A/QR/-X	TRANSISTOR
		Q2055	UN521E	TRANSISTOR
			or DTC144WU	TRANSISTOR
			or RN1309	TRANSISTOR
		Q2103	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q2251	UN511E	TRANSISTOR
			or DTA144WU	TRANSISTOR
			or RN2309	TRANSISTOR
		Q3001	PTZ-NV09	PHOTO TRANSISTO
			or PTZ-NV16	PHOTO TRANSISTO
		Q3002	PTZ-NV09	PHOTO TRANSISTO
			or PTZ-NV16	PHOTO TRANSISTO
		Q3003	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q3004	2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
		Q3005	UN5211	TRANSISTOR
			or RN1302	TRANSISTOR
			or DTC114EU	TRANSISTOR
		Q4001	UN5211	TRANSISTOR
			or DTC114EU	TRANSISTOR
			or RN1302	TRANSISTOR
		Q4002	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q5101	2SK2043-CB14	FE TRANSISTOR
			or 2SK2324	FE TRANSISTOR
			or 2SK1953	FE TRANSISTOR
			or 2SK2043	FE TRANSISTOR
			or 2SK2324-LT	MOS FET
		Q5102	2SD2144S/UV/-T	TRANSISTOR
		Q6001	2SC3243/DE/-T	TRANSISTOR
		Q6031	UN5216	TRANSISTOR
			or DTC143TU	TRANSISTOR
		Q7201	2SB1256	TRANSISTOR
		D16	1N4148M	DIODE
			or 1SS133	DIODE
		D17	1N4148M	DIODE
			or 1SS133	DIODE
		D201	1N4148M	DIODE
			or 1SS133	DIODE
		D202	1N4148M	DIODE
			or 1SS133	DIODE
		D207	1N4148M	DIODE
			or 1SS133	DIODE
		D208	1N4148M	DIODE
			or 1SS133	DIODE
		D2001	1N4148M	DIODE
			or 1SS133	DIODE
		D2201	11ES2	DIODE
		D2252	1N4148M	DIODE
			or 1SS133	DIODE
		D3001	LNB2301L01VI	LE DIODE
		D3002	1N4148M	DIODE
			or 1SS133	DIODE
		D3004	11ES2	DIODE

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		D3005	11ES2	DIODE	
		D3006	RD39ES/B3/-T2	ZENER DIODE	
		D3007	1N4148M	DIODE	
			or 1SS133	DIODE	
		D4003	1N4148M	DIODE	
			or 1SS133	DIODE	
		D4004	1N4148M	DIODE	
			or 1SS133	DIODE	
		D5001	S1WB(A)60F4102	BRIDGE DIODE	
			or S1WB(A)60F4062X	BRIDGE DIODE	
			or S1WB(A)60F4072X	BRIDGE DIODE	
		D5101	AU01	FR DIODE	
			or ERA18-04-T2	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
			or 10ELS4	FR DIODE	
		D5102	AU01	FR DIODE	
			or ERA18-04-T2	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
			or 10ELS4	FR DIODE	
		D5103	1N4148M	DIODE	
			or 1SS133	DIODE	
		D5104	UZ15BSC	ZENER DIODE	
			or RD15ES/B3/-T2	ZENER DIODE	
			or MTZJ15C	ZENER DIODE	
		D5201	ERA18-02-T2	FR DIODE	
			or 1SR153-200-T2	FR DIODE	
		D5203	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or 1SR153-200-T2	FR DIODE	
			or 10ELS2	FR DIODE	
		D5204	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or 1SR153-200-T2	FR DIODE	
			or 10ELS2	FR DIODE	
		D5205	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or 1SR153-200-T2	FR DIODE	
			or 10ELS2	FR DIODE	
		D5207	AK04	DIODE	
			or 11EQS04	SB DIODE	
		D5210	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or 1SR153-200-T2	FR DIODE	
			or 10ELS2	FR DIODE	
		D5211	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or 1SR153-200-T2	FR DIODE	
			or 10ELS2	FR DIODE	
		D5301	UZ15BSA	ZENER DIODE	
			or MTZJ15A	ZENER DIODE	
			or RD15ES/B1/-T2	ZENER DIODE	
		D5304	1N4148M	DIODE	
			or 1SS133	DIODE	
		D5305	UZ30BSA	ZENER DIODE	
			or RD30ES/B1/-T2	ZENER DIODE	
			or MTZJ30A	ZENER DIODE	
		D5306	UZ6.8BSA	ZENER DIODE	
			or MTZJ6.8A	ZENER DIODE	
			or RD6.8ES/B1/-T2	ZENER DIODE	
		D6001	MTZJ10B	ZENER DIODE	
		D6002	HZ30-2L-T2	ZENER DIODE	
			or HZ30-2LTD	Z DIODE (M)	
		D7002	RD9.1ES/B2/-T2	ZENER DIODE	
			or MTZJ9.1B	ZENER DIODE	
			or UZ9.1BSB	ZENER DIODE	
		R1	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R2	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
		R3	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R11	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
		R14	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R15	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R16	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R17	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R18	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R19	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R21	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R22	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R23	NRSA02J-392X	MG RESISTOR	3.9kΩ,1/10W
		R24	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R25	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R29	QRE123J-331X	RESISTOR	330Ω,1/2W
		R30	NRSA02J-680X	MG RESISTOR	68Ω,1/10W
		R31	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R32	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R33	QUY153-050Y	RESISTOR	
		R44	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R51	NRSA02J-125X	MG RESISTOR	1.2MΩ,1/10W
		R110	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R122	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R123	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R124	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R202	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R203	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R204	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R205	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R206	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R208	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R209	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R212	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R214	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R230	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2001	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2002	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2003	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2004	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
		R2005	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R2006	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R2007	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
		R2013	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2016	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2018	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2019	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2053	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2054	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R2055	NRSA02J-3R3X	MG RESISTOR	3.3Ω,1/10W
		R2056	QRE141J-820Y	RESISTOR	82Ω,1/4W
		R2057	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2058	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2059	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2060	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2106	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R2107	QRE141J-102Y	RESISTOR	1kΩ,1/4W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R2201	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2202	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
		R2203	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2205	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2206	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2207	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2209	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2210	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2211	NRSA02J-511X	MG RESISTOR	510Ω,1/10W
		R2213	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2214	NRSA02J-511X	MG RESISTOR	510Ω,1/10W
		R2215	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2217	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2218	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2219	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2221	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2222	QRE141J-333Y	RESISTOR	33kΩ,1/4W
		R2223	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R2224	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R2225	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R2226	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2228	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R2229	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R2251	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R2253	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2254	NRSA02J-180X	MG RESISTOR	18Ω,1/10W
		R2258	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R2259	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R2602	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R2603	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2605	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R2606	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2607	QRE141J-101Y	RESISTOR	100Ω,1/4W
		R2608	QRE141J-101Y	RESISTOR	100Ω,1/4W
		R2609	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3001	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3002	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3003	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3004	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3005	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3008	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3010	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3013	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3014	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3017	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3021	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3026	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3027	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3030	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3031	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3032	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3033	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3044	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3045	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3046	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3047	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3048	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3050	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3051	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3052	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3053	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3057	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3060	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3061	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3062	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3063	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3064	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3066	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3068	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3069	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3070	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3071	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3072	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3074	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3075	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3076	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3079	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3080	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3081	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3082	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3101	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3201	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3202	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3203	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3204	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R3205	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R3206	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3207	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3208	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3209	QRE141J-181Y	RESISTOR	180Ω,1/4W
		R3210	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R3211	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R3212	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R3213	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R3214	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R3215	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R3216	NRSA02J-474X	MG RESISTOR	470kΩ,1/10W
		R3217	NRSA02J-334X	MG RESISTOR	330kΩ,1/10W
		R3219	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3220	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3222	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3223	NRSA02J-105X	MG RESISTOR	1MΩ,1/10W
		R3224	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3225	NRSA02J-475X	MG RESISTOR	4.7MΩ,1/10W
		R3226	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3227	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3229	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
		R3232	QRE141J-104Y	RESISTOR	100kΩ,1/4W
		R3233	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3234	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3236	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R4001	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R4002	NRSA02J-223X	MG RESISTOR	22kΩ,1/10W
		R4003	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R4004	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R4005	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4006	NRSA02J-392X	MG RESISTOR	3.9kΩ,1/10W
		R4007	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4009	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4010	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R4011	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R4012	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R4013	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R4018	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4019	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4020	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4021	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R4022	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R4025	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R4026	QRE141J-103Y	RESISTOR	10kΩ,1/4W
	⚠	R5001	QRZ9047-475	RESISTOR	4.7MΩ
		R5101	QRE141J-224Y	RESISTOR	220kΩ,1/4W
		R5102	QRE141J-224Y	RESISTOR	220kΩ,1/4W
		R5103	QRE141J-683Y	RESISTOR	68kΩ,1/4W
		R5104	QRG02GJ-683	OMF RESISTOR	68kΩ,2W
		R5106	QRT01DJ-R39X	MF RESISTOR	0.39Ω,1W
		R5107	QRE121J-331Y	RESISTOR	330Ω,1/2W
		R5108	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R5109	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R5110	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
		R5301	NRSA02J-5R6X	MG RESISTOR	5.6Ω,1/10W
		R5302	NRSA02J-5R6X	MG RESISTOR	5.6Ω,1/10W
		R5303	NRSA02J-5R6X	MG RESISTOR	5.6Ω,1/10W
		R5304	NRSA02J-5R6X	MG RESISTOR	5.6Ω,1/10W
		R5306	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
		R5307	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R5312	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R5313	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
	⚠	R5314	QRZ9005-221X	FUSI RESISTOR	
		R6001	NRSA02J-271X	MG RESISTOR	270Ω,1/10W
		R6002	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R6020	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6021	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6022	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6023	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6032	NRSA02J-393X	MG RESISTOR	39kΩ,1/10W
		R6033	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R6034	NRSA02J-105X	MG RESISTOR	1MΩ,1/10W
		R6038	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R6053	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6501	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R6502	NRSA02J-334X	MG RESISTOR	330kΩ,1/10W
		R6503	NRSA02J-124X	MG RESISTOR	120kΩ,1/10W
		R6504	NRSA02J-302X	MG RESISTOR	3kΩ,1/10W
		R6505	NRSA02J-512X	MG RESISTOR	5.1kΩ,1/10W
		R6506	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
		R6507	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
		R6508	NRSA02J-392X	MG RESISTOR	3.9kΩ,1/10W
		R6509	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R6510	NRSA02J-392X	MG RESISTOR	3.9kΩ,1/10W
		R6511	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R6514	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6515	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R7001	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7002	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7003	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7004	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7005	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7006	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7007	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7008	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7009	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
		R7013	QRE141J-103Y	RESISTOR	10kΩ,1/4W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R7014	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R7017	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7020	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7021	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7022	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R7023	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7024	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R7025	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R7026	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R7027	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
		R7028	NRSA02J-393X	MG RESISTOR	39kΩ,1/10W
		R7030	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7031	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7032	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R7033	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7034	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R7035	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R7036	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R7037	QRE141J-153Y	RESISTOR	15kΩ,1/4W
		R7038	NRSA02J-393X	MG RESISTOR	39kΩ,1/10W
		R7050	NRSA02J-393X	MG RESISTOR,VP655U/VP656U/U(C)	39kΩ,1/10W
		R7051	NRSA02J-393X	MG RESISTOR,VP654U/U(C)	39kΩ,1/10W
		R7053	NRSA02J-393X	MG RESISTOR	39kΩ,1/10W
		R7202	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R7203	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7204	QRL01DJ-100X	OMF RESISTOR	10Ω,1W
		C1	QEKC1CM-106	E CAPACITOR	10µF,16V
		C2	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C3	NCF21CZ-105X	CAPACITOR	1µF,16V
		C4	NCF21CZ-105X	CAPACITOR	1µF,16V
		C5	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C7	QEKC0JM-107	E CAPACITOR	100µF,6.3V
		C9	NCF21CZ-105X	CAPACITOR	1µF,16V
		C10	NCF21CZ-105X	CAPACITOR	1µF,16V
		C12	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C13	QEKJ1HM-335	E CAPACITOR	3.3µF,50V
		C14	NCB21HK-333X	CAPACITOR	0.033µF,50V
		C17	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C20	QEKJ1HM-225	E CAPACITOR	2.2µF,50V
		C21	NCB21HK-472X	CAPACITOR	0.0047µF,50V
		C23	NCB21EK-223X	CAPACITOR	0.022µF,25V
		C24	NCF21CZ-474X	CAPACITOR	0.47µF,16V
		C25	NCB21EK-683X	CAPACITOR	0.068µF,25V
		C29	QEKJ1EM-475	E CAPACITOR	4.7µF,25V
		C31	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C32	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C34	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C36	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C37	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
		C38	NDC21HJ-240X	CAPACITOR	24pF,50V
		C40	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C41	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C42	NCB21HK-103X	CAPACITOR	0.01µF,50V
		C43	NDC21HJ-7R0X	CAPACITOR	7pF,50V
		C44	NDC21HJ-220X	CAPACITOR	22pF,50V
		C45	NCB21EK-104X	CAPACITOR	0.1µF,25V
		C48	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
		C49	NDC21HJ-331X	CAPACITOR	330pF,50V
		C51	QEKJ1HM-105	E CAPACITOR	1µF,50V
		C52	QEKJ1HM-105	E CAPACITOR	1µF,50V
		C53	QEKJ1HM-105	E CAPACITOR	1µF,50V

#	△ REF No.	PART No.	PART NAME, DESCRIPTION	
	C54	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
	C55	QEKJ1CM-106	E CAPACITOR	10μF,16V
	C56	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
	C57	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C58	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C59	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C60	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C61	NDC21HJ-330X	CAPACITOR	33pF,50V
	C62	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C63	NDC21HJ-151X	CAPACITOR	150pF,50V
	C64	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
	C65	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C66	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C67	QEKJ1CM-476	E CAPACITOR	47μF,16V
	C68	QETC0JM-477	E CAPACITOR	470μF,6.3V
	C107	NDC21HJ-3R0X	CAPACITOR	3pF,50V
	C108	QCFB1HZ-104	CAPACITOR	0.1μF,50V
	C124	NDC21HJ-151X	CAPACITOR	150pF,50V
	C125	NDC21HJ-8R0X	CAPACITOR	8pF,50V
	C133	QCFB1HZ-104	CAPACITOR	0.1μF,50V
	C134	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C135	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C136	NCB11EK-104X	CAPACITOR	0.1μF,25V
	C137	NDC21HJ-390X	CAPACITOR	39pF,50V
	C201	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C203	NDC21HJ-330X	CAPACITOR	33pF,50V
	C204	NDC21HJ-330X	CAPACITOR	33pF,50V
	C205	NDC21HJ-101X	CAPACITOR	100pF,50V
	C206	NDC21HJ-150X	CAPACITOR	15pF,50V
	C207	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C209	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C211	QEKJ1HM-105	E CAPACITOR	1μF,50V
	C212	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C213	QEKJ1HM-105	E CAPACITOR	1μF,50V
	C214	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C215	QEKJ0JM-107	E CAPACITOR	100μF,6.3V
	C217	NDC21HJ-150X	CAPACITOR	15pF,50V
	C2002	QEKJ1CM-476	E CAPACITOR	47μF,16V
	C2003	NCB21HK-123X	CAPACITOR	0.012μF,50V
	C2004	QEKJ1CM-226	E CAPACITOR	22μF,16V
	C2005	NCB21HK-102X	CAPACITOR	0.001μF,50V
	C2007	QEKJ1CM-106	E CAPACITOR	10μF,16V
	C2008	NCB21HK-152X	CAPACITOR	0.0015μF,50V
	C2009	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
	C2010	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
	C2013	NCB21HK-683X	CAPACITOR	0.068μF,50V
	C2015	QEKJ1CM-226	E CAPACITOR	22μF,16V
	C2016	QETC1HM-475	E CAPACITOR	4.7μF,50V
	C2051	NCB21HK-331X	CAPACITOR	330pF,50V
	C2052	QFV61HJ-823	F CAPACITOR	0.082μF,50V
	C2053	NCB21HK-472X	CAPACITOR	0.0047μF,50V
	C2054	NCB21HK-223X	CAPACITOR	0.022μF,50V
	C2055	QEKJ1CM-106	E CAPACITOR	10μF,16V
	C2202	QEKJ1CM-226	E CAPACITOR	22μF,16V
	C2207	NCB21HK-473X	CAPACITOR	0.047μF,50V
	C2208	QEKJ1CM-476	E CAPACITOR	47μF,16V
	C2209	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
	C2210	QEKJ1CM-476	E CAPACITOR	47μF,16V
	C2211	NCB21HK-153X	CAPACITOR	0.015μF,50V
	C2212	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C2213	QEKJ1EM-475	E CAPACITOR	4.7μF,25V

#	△ REF No.	PART No.	PART NAME, DESCRIPTION	
	C2214	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C2215	QEKJ1HM-224	E CAPACITOR	0.22μF,50V
	C2216	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
	C2217	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C2218	NCB21HK-153X	CAPACITOR	0.015μF,50V
	C2219	QEKJ1CM-476	E CAPACITOR	47μF,16V
	C2220	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
	C2221	NCB21HK-473X	CAPACITOR	0.047μF,50V
	C2222	QEKJ1CM-476	E CAPACITOR	47μF,16V
	C2227	QEKJ1HM-105	E CAPACITOR	1μF,50V
	C2228	QEKJ1CM-476	E CAPACITOR	47μF,16V
	C2229	QEKJ1CM-476	E CAPACITOR	47μF,16V
	C2230	QEKJ1CM-106	E CAPACITOR	10μF,16V
	C2231	QEKJ1CM-106	E CAPACITOR	10μF,16V
	C2232	QEKJ1CM-106	E CAPACITOR	10μF,16V
	C2235	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C2251	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C2252	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C2253	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C2254	QEKJ1CM-476	E CAPACITOR	47μF,16V
	C2255	NCF21EZ-104X	CAPACITOR	0.1μF,25V
	C2256	NDC21HJ-101X	CAPACITOR	100pF,50V
	C2257	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C2258	NCB21HK-223X	CAPACITOR	0.022μF,50V
	C2259	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C2260	NCB21HK-331X	CAPACITOR	330pF,50V
	C3002	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C3003	QETC1HM-106	E CAPACITOR	10μF,50V
	C3004	NCF21CZ-105X	CAPACITOR	1μF,16V
	C3005	NCF21CZ-105X	CAPACITOR	1μF,16V
	C3008	NCB21HK-102X	CAPACITOR	0.001μF,50V
	C3013	QEKJ1CM-106	E CAPACITOR	10μF,16V
	C3015	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C3016	NDC21HJ-180X	CAPACITOR	18pF,50V
	C3017	NDC21HJ-100X	CAPACITOR	10pF,50V
	C3019	NDC21HJ-120X	CAPACITOR	12pF,50V
	C3020	NDC21HJ-330X	CAPACITOR	33pF,50V
	C3021	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C3022	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C3023	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C3024	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
	C3025	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C3026	QEKJ1CM-106	E CAPACITOR	10μF,16V
	C3028	QETL0JM-338	E CAPACITOR	3300μF,6.3V
	C3029	NCB21HK-103X	CAPACITOR	0.01μF,50V
	C3030	QEKJ0JM-227	E CAPACITOR	220μF,6.3V
	C3043	NCB21HK-473X	CAPACITOR	0.047μF,50V
	C4001	NCB21EK-104X	CAPACITOR	0.1μF,25V
	C4002	QEKJ1HM-224	E CAPACITOR	0.22μF,50V
	C4004	QEKJ0JM-226	E CAPACITOR	22μF,6.3V
	C4007	NCB21HK-273X	CAPACITOR	0.027μF,50V
	C4008	QEKJ1CM-106	E CAPACITOR	10μF,16V
	C4009	NCB21HK-102X	CAPACITOR	0.001μF,50V
	C4011	NCB21CK-224X	CAPACITOR	0.22μF,16V
	C4012	NCB21EK-563X	CAPACITOR	0.056μF,25V
	C4013	NCB21HK-102X	CAPACITOR	0.001μF,50V
	C4014	NDC21HJ-101X	CAPACITOR	100pF,50V
	C4015	NDC21HJ-101X	CAPACITOR	100pF,50V
	C4016	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
	C4017	NCB21HJ-103X	CAPACITOR	0.01μF,50V
	C4019	NCB21EK-104X	CAPACITOR	0.1μF,25V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	⚠	C5001	QFZ9051-473	F CAPACITOR	0.047μF
	⚠	C5004	QCZ9073-472	CAPACITOR	0.0047μF
	⚠	C5006	QETM2DM-826	E CAPACITOR	82μF,200V
		C5101	QCZ0212-472	CAPACITOR	0.0047μF,1kV
		C5102	QCZ0136-101Z	CAPACITOR	100pF,1kV
		C5103	NCB21HK-331X	CAPACITOR	330pF,50V
		C5104	QETC1HM-105	E CAPACITOR	1μF,50V
		C5105	QFLC1HJ-183Z	F CAPACITOR	0.018μF,50V
		C5107	QFV11HJ-104	F CAPACITOR	0.1μF,50V
		C5201	QEMU0JM-227	E CAPACITOR	220μF,6.3V
		C5202	QEMT1CM-827	E CAPACITOR	820μF,16V
		C5203	QETC1CM-227	E CAPACITOR	220μF,16V
		C5204	QEMT1AM-687	E CAPACITOR	680μF,10V
		C5205	QETC1AM-227	E CAPACITOR	220μF,10V
		C5207	QETC1JM-106	E CAPACITOR	10μF,63V
		C5208	QETC1HM-106	E CAPACITOR	10μF,50V
		C5301	QEMU0JM-227	E CAPACITOR	220μF,6.3V
		C5302	QETC1HM-106	E CAPACITOR	10μF,50V
		C5303	QETC1CM-107	E CAPACITOR	100μF,16V
		C5304	QFLC1HJ-183Z	F CAPACITOR	0.018μF,50V
		C5306	NCF21HZ-103X	CAPACITOR	0.01μF,50V
		C6024	NCB21EK-563X	CAPACITOR	0.056μF,25V
		C6031	QETC1HM-106	E CAPACITOR	10μF,50V
		C6033	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C6501	QETC1CM-226	E CAPACITOR	22μF,16V
		C6502	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C6503	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C6504	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C6505	QETC1HM-225	E CAPACITOR	2.2μF,50V
		C6506	QEKJ1HM-104	E CAPACITOR	0.1μF,50V
		C6507	NCB21EK-473X	CAPACITOR	0.047μF,25V
		C6508	QETC1HM-474	E CAPACITOR	0.47μF,50V
		C6509	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C6510	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C6511	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C6512	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C6513	QEE81CJ-335	T CAPACITOR	3.3μF,16V
		C6514	QEE81CJ-106	T CAPACITOR	10μF,16V
		C6515	QETC1HM-105	E CAPACITOR	1μF,50V
		C6516	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C6517	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C6518	QETC1HM-105	E CAPACITOR	1μF,50V
		C7001	QDVB1EZ-223Y	CAPACITOR	0.022μF,25V
		C7002	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C7007	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C7008	NCF21HZ-223X	CAPACITOR	0.022μF,50V
		C7009	NDC21HJ-220X	CAPACITOR	22pF,50V
		C7010	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C7011	QEKJ0JM-227	E CAPACITOR	220μF,6.3V
		C7014	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C7207	QETC0JM-477	E CAPACITOR	470μF,6.3V
		L1	QQL29BJ-101Z	COIL	100μH
		L4	QQL29BJ-101Z	COIL	100μH
		L5	QQL231J-121Y	COIL	120μH
		L7	QQL29BJ-2R2Z	COIL	2.2μH
		L8	QQL29BJ-101Z	COIL	100μH
		L9	QQL29BJ-101Z	COIL	100μH
		L10	QQL29BJ-100Z	COIL	10μH
		L17	QQL01BJ-120Z	COIL	12μH
		L20	QQL231J-680Y	COIL	68μH
		L201	QQL29BJ-100Z	COIL	10μH
		L202	QQL29BJ-470Z	COIL	47μH
		L203	QQL29BJ-220Z	COIL	22μH
		L204	QQL231J-4R7Y	COIL	4.7μH
		L2001	QQL29BJ-100Z	COIL	10μH
		L2251	QQL29BJ-2R2Z	COIL	2.2μH
		L5201	PELN1184	COIL	
		L5202	PELN1184	COIL	
	⚠	L5301	QQL01BK-101Z	COIL	100μH
		L7201	QQL242J-101Z	COIL	100μH
		L7202	QQL242J-101Z	COIL	100μH
		X2	QAX0435-001	CRYSTAL RESONATOR	
		X3001	QAX0320-001	CRYSTAL RESONATOR	
		X3002	QAX0444-001	CRYSTAL RESONATOR	
		S3001	QSW0602-001	PUSH SWITCH,REC SAFETY	
		S6050	PESW0701	SLIDE SWITCH	
		S7001	QSW0619-002Z	TACT SWITCH,POWER	
		S7002	QSW0619-002Z	TACT SWITCH,MENU	
		S7004	QSW0619-002Z	TACT SWITCH,CH-	
		S7006	QSW0619-002Z	TACT SWITCH,CH+	
		S7008	QSW0619-002Z	TACT SWITCH,OK	
		S7010	QSW0619-002Z	TACT SWITCH,REW	
		S7011	QSW0619-002Z	TACT SWITCH,REC	
		S7012	QSW0619-002Z	TACT SWITCH,PLAY	
		S7013	QSW0619-002Z	TACT SWITCH,STOP/EJECT	
		S7014	QSW0619-002Z	TACT SWITCH,FF	
		S7015	QSW0619-002Z	TACT SWITCH,PAUSE	
		S7016	QSW0619-002Z	TACT SWITCH,REVIEW	
		K5101	QQR0678-001Z	FERRATE BEADS	
	⚠	PC5101	PS2501-1	PH COUPLER	
		PS3001	GP3S123	PHOTOTRANSISTOR	
		PS3002	GP3S123	PHOTOTRANSISTOR	
		T2051	PELN0832	OSC TRANSFORMER	
	⚠	T5001	QQS0011-001	SW TRANSF	
		HD1	PQ35479-1-4	HOLDER(FDP),DI7001	
		OT1	LP40226-001A	PC SUPPORT,X2	
		OT3005	QGZ2501L1-02	SHORT SOCKET,CN3005	
		SD1	LP30313-001A	SHIELD CASE,PRE/REC	
		DI7001	QLF0031-001	FL TUBE	
		TU6001	QAU0014-002	TUNER	
		TU6002	QAU0067-001	IF UNIT	
		J1	QNN0009-001	PIN JACK,A/V IN	
		J2	QNN0010-001	PIN JACK,A/V OUT	
		TB1	LP20316-001A	TERMINAL BOARD	
		FC5001	QNG0006-001Z	FUSE CLIP	
		FC5002	QNG0006-001Z	FUSE CLIP	
		FW3001	QUM032-13A4A4	WIRE,(1-2)R.PAUSE	
		FW3002	QUM032-28A4A4	WIRE,(1-2)C.BOX CTL	
		J7101	PEMC1162	PIN JACK,VIDEO IN	
		J7102	PEMC1158	PIN JACK(SW),AUDIO(L)IN	
		J7103	PEMC1158	PIN JACK(SW),AUDIO(R)IN	
	⚠	LF5002	QQR0532-001	LINE FILTER	
	⚠	SG5001	QAF0040-242	SURGE ABSORBER	
	⚠	VA5001	QAF0039-431	VARISTOR	
	⚠	VA5002	QAF0039-431	VARISTOR	
		CN1	QGF1018C1-11	FPC CONNECTOR,(1-11)U.DRUM	
		CN2001	QGF1207C1-07	FPC CONNECTOR,(1-7)A/C HEAD	
		CN2002	QGB2532J1-02	CONNECTOR,(1-2)FE HEAD	
		CN3001	QGB2015M1-08	CONNECTOR,(1-8)CAP MDA	
		CN3002	QGF1207C1-05	FPC CONNECTOR(1-5)DRUM MDA	
		CN3003	QGB2532J1-02	CONNECTOR,(1-2)LOADING MOTOR	
		CN3004	QGB2534J2-04	CONNECTOR,(1-4)ROTARY ENCODER	
		CN3005	QGG2504M1-02	HEADER PIN,(1-2)BACK UP	

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	⚠	CN5001	QGA7901C3-02	CONNECTOR,(1-2)AC IN	
	⚠	CP3001	ICP-N25	CIRCUIT PROTECTOR	
	⚠	CP4101	ICP-N15	CIRCUIT PROTECTOR	
	⚠	F5001	QMF51N2-1R25J1	FUSE	1.2A,AC250V

* * *

R.PAUSE BOARD ASSEMBLY <06>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		PW2	LPA10001-01B2	R.PAUSE BOARD ASSY	
		J7104	PU60612	MINI JACK	

* * *

AUDIO/CONTROL HEAD BOARD ASSEMBLY <12>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		PW1	LPA10010-01A1	A/C HEAD BOARD ASSY	
		CN1	QGF1208F1-07	FPC CONNECTOR	

* * *

MV/CM ADV BOARD ASSEMBLY <23>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		PW1	LPA10013-01B	MV/CM ADV BOARD ASSY	
		IC7401	AN3275SB	IC	
		Q7401	2SD1819A/QRS/-X	TRANSISTOR	
			or 2PC4081/R/-X	TRANSISTOR	
			or 2SC4081/QRS/-X	TRANSISTOR	
		Q7402	2SB1218A/QR/-X	TRANSISTOR	
			or 2SA1576A/QR/-X	TRANSISTOR	
			or 2PA1576/R/-X	TRANSISTOR	
		R7404	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R7408	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R7409	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R7410	NRSA02J-393X	MG RESISTOR	39kΩ,1/10W
		R7421	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R7422	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7427	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7428	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
		R7429	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7430	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R7431	NRSA02J-271X	MG RESISTOR	270Ω,1/10W
		R7437	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R7438	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R7439	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7440	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		C7401	QDYB1CM-103Y	CAPACITOR	0.01μF,16V
		C7402	QETC1CM-476	E CAPACITOR	47μF,16V
		C7403	QFN31HJ-272	F CAPACITOR	0.0027μF,50V
		C7406	NCB21HK-222X	CAPACITOR	0.0022μF,50V
		C7407	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C7411	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C7414	QFV91HJ-104	F CAPACITOR	0.1μF,50V
		C7415	QFV91HJ-224	F CAPACITOR	0.22μF,50V
		C7416	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C7417	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C7419	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C7420	NDC21HJ-390X	CAPACITOR	39pF,50V
		C7421	QETC1HM-105	E CAPACITOR	1μF,50V
		C7425	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C7426	QETC1HM-225	E CAPACITOR	2.2μF,50V
		C7427	NCF21EZ-104X	CAPACITOR	0.1μF,25V
		C7430	NCB21HK-562X	CAPACITOR	0.0056μF,50V
		C7431	NCB21HK-473X	CAPACITOR	0.047μF,50V
		C7432	NCB21HK-223X	CAPACITOR	0.022μF,50V
		L7401	QQL01BK-100Z	COIL	10μH
		L7402	QQL231J-470Y	COIL	47μH
		FL7401	PELN1137	LOW PASS FILTER	
		BK1	LP40077-001A	BRACKET(PWB)	
		CN7402	QGG2502K1-08	HEADER PIN,(1-8)MAIN	

* * *

LOADING MOTOR BOARD <55>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		PW2	LPA10010-01A2	L.MOTOR BOARD ASSY	
		CN1	QGB2533K1-02	CONNECTOR	

* * *

C.BOX CTL BOARD ASSEMBLY <92>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		PW3	LPA10001-01B3	C.BOX CTL BOARD ASSY	
		R7155	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		J7105	PU60612	MINI JACK	